

User's Manual



HWRGM1A

Hi-Gain Wireless-108G
MIMO Router with AMP Technology

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Introduction

Congratulations on purchasing the Hawking Technology Hi-Gain Wireless-108G MIMO Router. This Hi-Gain Wireless-108G MIMO Router is a cost-effective, powerful solution for sharing your broadband internet connection wirelessly or wired. The router features the latest in wireless technology to ensure the greatest distance and performance within your network.

Features

- High Internet Access throughput (108Mbps)
- AMP MIMO Technology for superior wireless performance
- Allow multiple users to share a single Internet line
- Supports up to 253 users
- Supports Apple Airport Extreme and Airport wireless cards
- Supports 802.11b and 802.11g wireless adapters
- Supports Airport Express Base Station™
- Internet Access via Cable or xDSL modem
- Works great with Airport Extreme Wireless Cards and Mac™ notebooks and computers
- Access Private LAN Servers from the Public Network
- Equipped with four LAN ports (10/100M) and one WAN port (10/100M)
- Provides IEEE 802.11g/b MIMO wireless LAN access point
- Support DHCP (Server/Client) for easy setup
- Support advance features such as: Special Applications, DMZ, Virtual Servers, Access Control, Firewall.
- Allow you to monitor the router's status such as: DHCP Client Log, System Log, Security Log and Device/Connection Status
- Easy to use Web-based GUI for configuration and management purposes
- Remote Management allows configuration and upgrades from a remote site (over the Internet)

Minimum Requirements

- One External xDSL (ADSL) or Cable modem with an Ethernet port (RJ-45)
- Network ready computer (PC or Mac with networking card)
- Mac's with a Web-Browser (Preferably Internet Explorer or Safari) or PCs with a Web-Browser (Internet Explorer 4.0 or higher, or Netscape Navigator 4.7 or higher)

Package Content

- One Hi-Gain Wireless-108G MIMO Router
- One Quick Installation Guide
- One CD-Rom with a Setup Wizard and Users Manual (PC and Mac)
- One Power Adapter
- Three WiFi Antennas
- One Ethernet Cable

Note

The WAN "idle timeout" auto-disconnect function may not work due to abnormal activities of some network application software, computer virus or hacker attacks from the Internet. For example, some software sends network packets to the Internet in the background, even when you are not using the Internet. So please turn off your computer when you are not using it. This function also may not work with some ISP. So please make sure this function can work properly

when you use this function in the first time, especially your ISP charges you based on the time used.

Getting to know the Hi-Gain Wireless-108G MIMO Router

Back Panel

The diagram (fig1.0) below shows the Hi-Gain Wireless-108G MIMO Router's back panel. The router's back panel is divided into three sections, **LAN**, **Modem** and **Reset**:

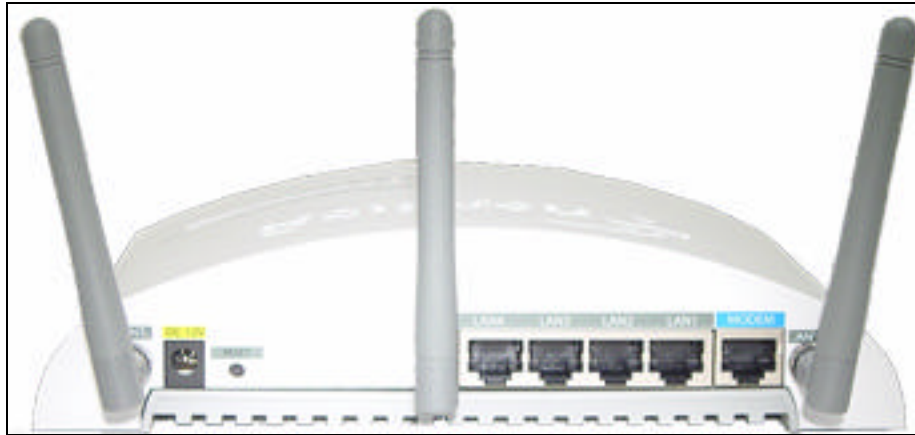


Figure 1.0

1) Local Area Network (LAN)

The Hi-Gain Wireless-108G MIMO Router's 4 LAN ports are where you connect your Mac PCs, Windows PC's, printer servers, hubs and switches etc. to your local area network.

2) Modem (Wide Area Network - WAN)

The Modem port is the segment connected to your xDSL or Cable broadband internet modem.

3) Reset

The Reset button allows you to do one of two things.

- 1) If problems occur with your router, press the router's reset button with a pencil tip (for less than 4 seconds) and the router will re-boot itself, keeping your original configurations.
- 2) If problems persist or you experience extreme problems or you forgot your password, press the reset button for longer than 4 seconds and the router will reset itself to the factory default settings (**warning**: your original configurations will be replaced with the factory default settings)

4) Antenna Connector (ANT)

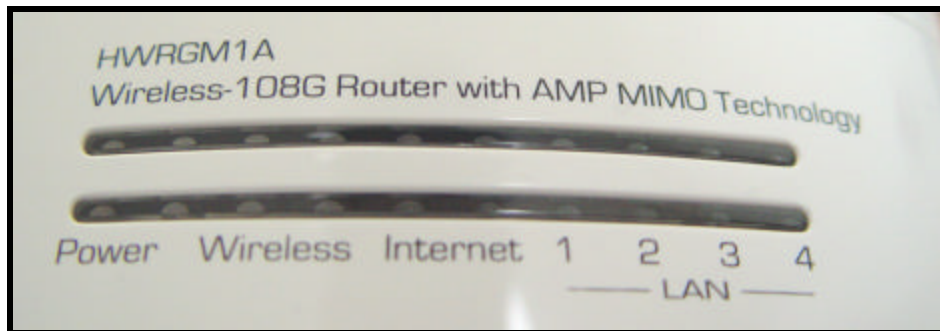
Antenna connectors for the included WiFi antennas in your packaging. Upgradeable to Hawking Hi-Gain WiFi Range Extending Antennas

5) Power (DC-12v)

Power plug port for included power adapter.

Front Panel

On the router's front panel there are LED lights that inform you of the router's current status. Below is an explanation of each LED and its description.



LED	Light Status	Description
Power	ON	Router's power supply is on
Internet	ON	Broadband Modem is connected
Internet LNK/ACT	OFF	Broadband Modem is not connected
	Flashing	Modem port has Activity (ACT), data being sent
LAN	ON	LAN port is connected
(Port 1-4)	OFF	LAN port is not connected
(Top and Bottom)	ON	LAN port is connected at 100Mbps
	Flashing	LAN port has Activity (ACT), data being sent
Wireless	ON	Wireless LAN has been activated
	OFF	Wireless LAN is disabled
	Flashing	Wireless LAN has Activity (ACT) data being sent

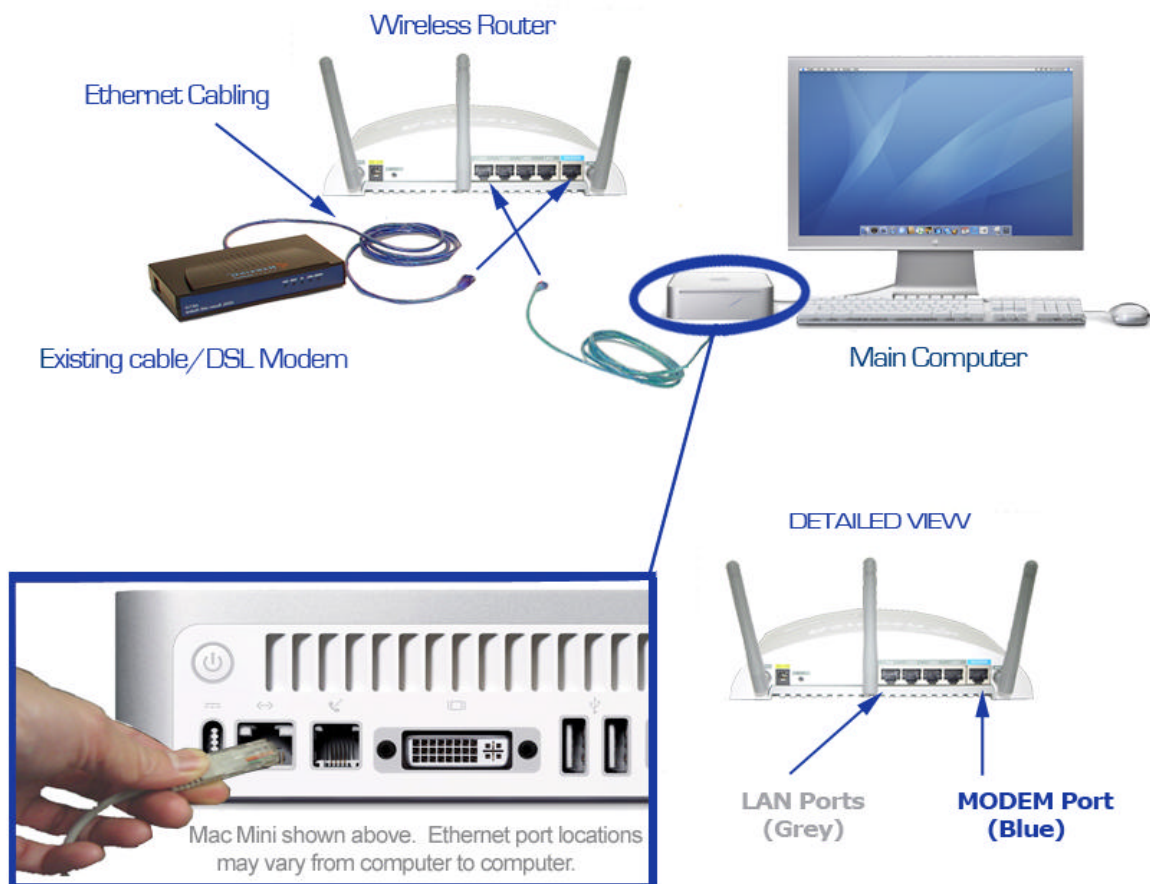
Setup Diagram

Figure 1.2 below shows a typical setup for a Local Area Network (LAN).

- 1) Remove the router and the power adapter from your package. Plug one end of the power into an available power outlet and the other into the "DC-IN" (YELLOW) on the router. (Place the router in between your cable/DSL modem and your computer to avoid cable clutter and usage of long cables)**



- 2) Connect an ethernet cable your existing Cable/DSL modem to the "MODEM" port of your Router. Connect another ethernet cable from any one of the 4 "LAN" ports on the Router to the open ethernet port on your computer. Turn on the power of each unit.**



Getting started

With the Setup CD

- 1) Insert the included Setup CD into your CD-Rom drive.
- 2) Select the Setup Wizard selection
- 3) Follow the steps accordingly until your setup is complete

Manually without the Setup CD (incase the CD does not work or is lost)

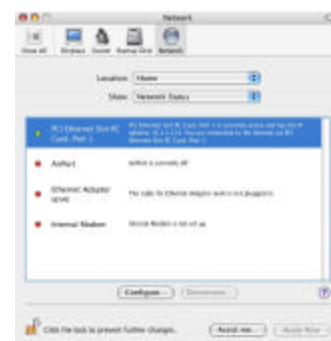
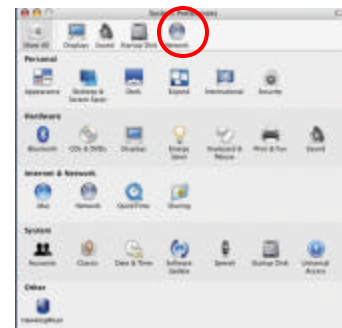
This is a step-by-step instruction on how to start using the router and get connected to the Internet. This section will detail the instructions for a manual connection.

- 1) Setup your network as shown in the setup diagram above (fig 1.2).
- 2) You then need to set your Local Area Network (LAN) computers so that they can obtain an IP address automatically from the router. All LAN clients require an IP address. Just like an address, it allows LAN clients to find one another. (If you have already configured your PC or Mac to obtain an IP automatically then proceed to step 3, page 11)

Configure your MAC to obtain an IP address automatically (PC Setup is below)

OS X 10.1 and up, older OS X versions may differ slightly:

- Open the System Preferences window by clicking on the Apple icon on the top left corner of your desktop and selecting the System Preferences link.
- In the System Preferences Window find the Network icon and select it.
- Locate your network adapter in the main field (AirPort or Built-in Ethernet etc..) and double click it.
- Select the TCP/IP tab and select "Using DHCP" from the Configure IPv4 drop down menu.
- Click on Renew DHCP Lease and click Apply Now.
- This procedure should set your Mac up with a new IP address obtained directly from the Hawking Wireless-G Router



Mac Fixed IP Configuration

- If your Mac is using a fixed IP Address (aka Manual IP Address), its IP Address must be within the range 192.168.1.1 to 192.168.1.253 to be compatible with the Wireless Router's default IP Address of 192.168.1.254. Also, the *Network Mask* must be set to 255.255.255.0. To change your manually set IP Address on your computer, select the drop down menu

under “Configure IPv4” from the Network menu of your specific network adapter.

- Select Manually and enter the correct information in your IP Address fields.
- Ensure that your Computer and the Wireless Router are on the same network segment. (If you don't have a router, this must be the case.)

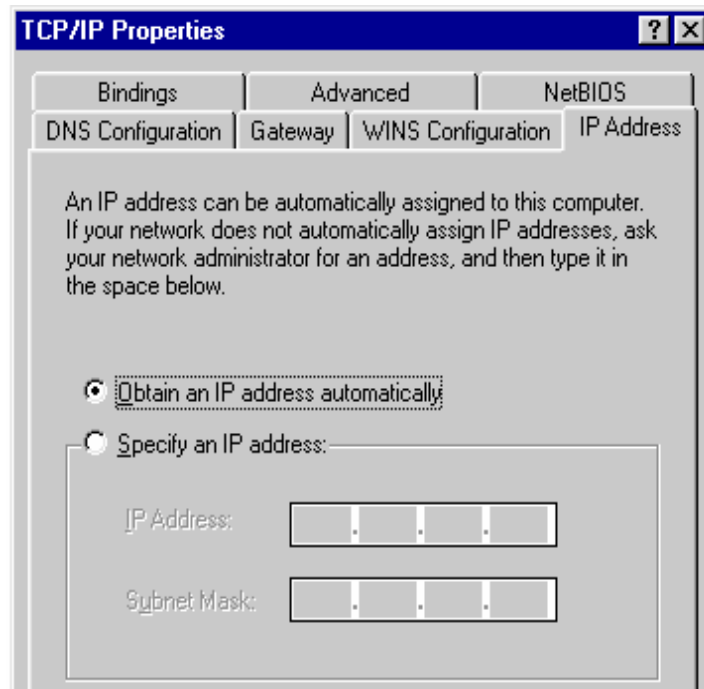
Ensure you are using the wired LAN interface. The Wireless interface can only be used if its configuration matches your MAC's wireless settings.

Configure your PC to obtain an IP address automatically

By default the Hi-Gain Wireless-108G MIMO Router's DHCP is on, this means that you can obtain an IP address automatically once you've configured your PC to obtain an IP address automatically. This section will show you how to configure your PC's so that it can obtain an IP address automatically for either Windows 95/98/Me, 2000 or NT operating systems. For other operating systems (Macintosh, Sun, etc.), follow the manufacturer's instructions. The following is a step-by-step illustration on how to configure your PC to obtain an IP address automatically for 2a) **Windows 95/98/Me**, 2b) **Windows XP**, 2c) **Windows 2000** and 2d) **Windows NT**.

2a) Windows 95/98/Me

- 1: Click the *Start* button and select *Settings*, then click *Control Panel*. The *Control Panel* window will appear.
- 2: Double-click *Network* icon. The *Network* window will appear.
- 3: Check your list of Network Components. If TCP/IP is not installed, click the *Add* button to install it now. If TCP/IP is installed, go to **step 6**.
- 4: In the *Network Component Type* dialog box, select *Protocol* and click *Add* button.
- 5: In the *Select Network Protocol* dialog box, select *Microsoft* and *TCP/IP* and then click the *OK* button to start installing the TCP/IP protocol. You may need your Windows CD to complete the installation.
- 6: After installing TCP/IP, go back to the *Network* dialog box. Select *TCP/IP* from the list of *Network Components* and then click the *Properties* button.
- 7: Check each of the tabs and verify the following settings:
 - **Bindings:** Check *Client for Microsoft Networks* and *File and printer sharing for Microsoft Networks*.
 - **Gateway:** All fields are blank.
 - **DNS Configuration:** Select *Disable DNS*.
 - **WINS Configuration:** Select *Disable WINS Resolution*.
 - **IP Address:** Select *Obtain IP address automatically*.



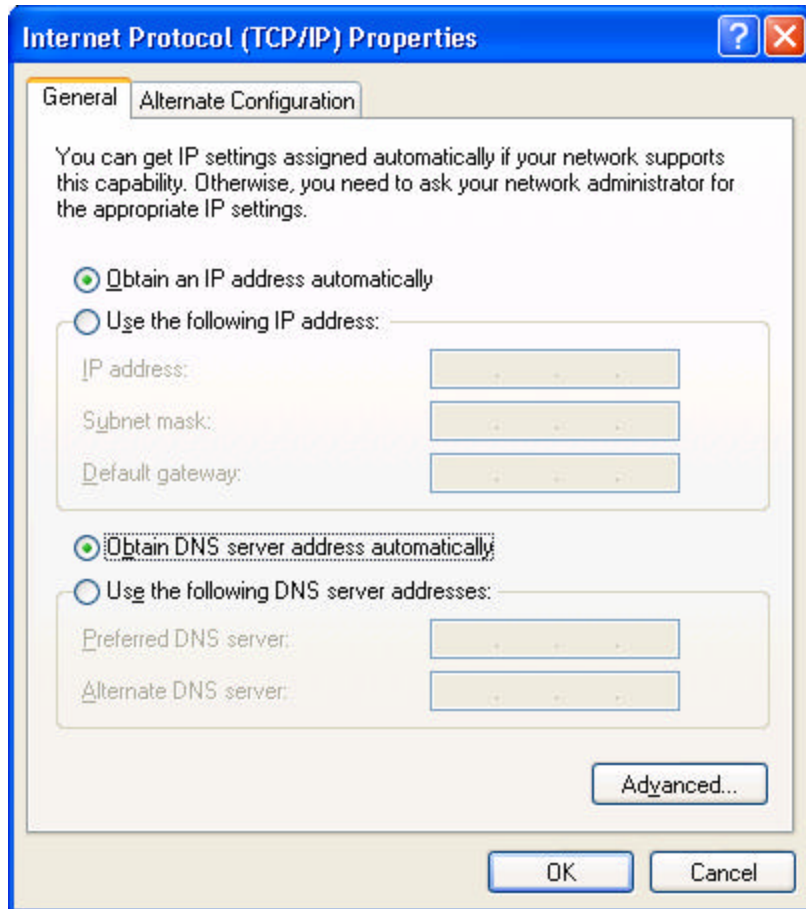
8: Reboot the PC. Your PC will now obtain an IP address automatically from your Hi-Gain Wireless-108G MIMO Router's DHCP server.

Note: Please make sure that the Hi-Gain Wireless-108G MIMO Router's DHCP server is the only DHCP server available on your LAN.

Once you've configured your PC to obtain an IP address automatically, please proceed to Step 3

2b) Windows XP

- 1: Click the *Start* button and select *Settings*, then click *Network Connections*. The *Network Connections* window will appear.
- 2: Double-click *Local Area Connection* icon. The *Local Area Connection* window will appear.
- 3: Check your list of Network Components. You should see *Internet Protocol [TCP/IP]* on your list. Select it and click the *Properties* button.
- 4: In the Internet Protocol (TCP/IP) Properties window, select *Obtain an IP address automatically* and *Obtain DNS server address automatically* as shown on the following screen.



5: Click *OK* to confirm the setting. Your PC will now obtain an IP address automatically from your Hi-Gain Wireless-108G MIMO Router's DHCP server.

Note: Please make sure that the Hi-Gain Wireless-108G MIMO Router's DHCP server is the only DHCP server available on your LAN.

Once you've configured your PC to obtain an IP address automatically, please proceed to Step 3.

2c) Windows 2000

1: Click the *Start* button and select *Settings*, then click *Control Panel*. The *Control Panel* window will appear.

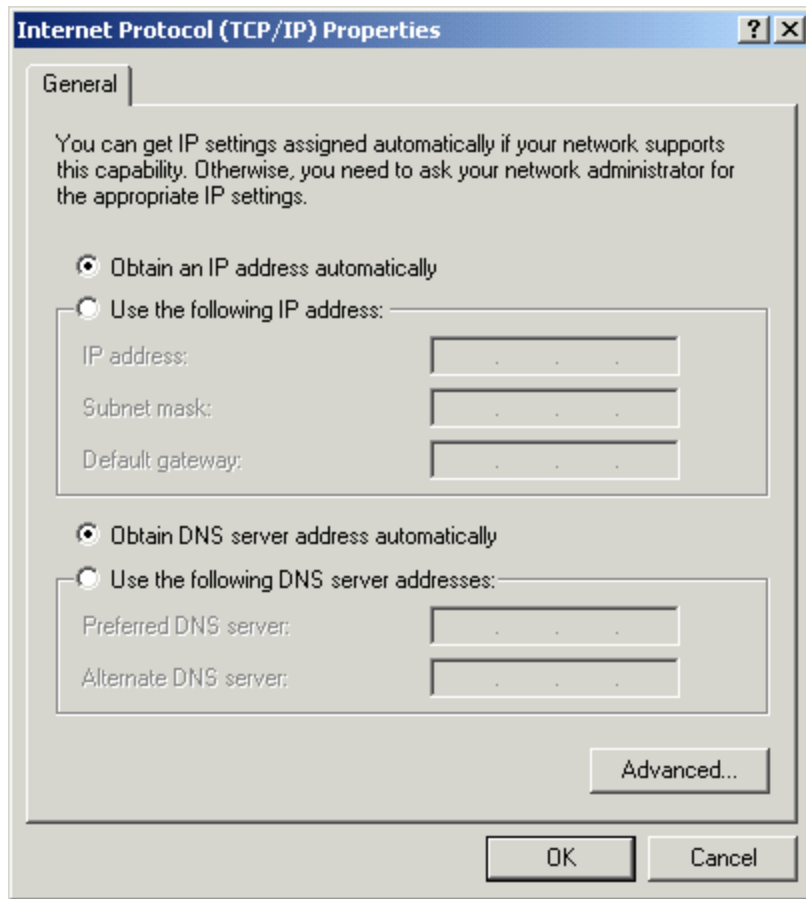
2: Double-click *Network and Dial-up Connections* icon. In the *Network and Dial-up Connection* window, double-click *Local Area Connection* icon. The *Local Area Connection* window will appear.

3: In the *Local Area Connection* window, click the *Properties* button.

4: Check your list of Network Components. You should see *Internet Protocol [TCP/IP]* on your list. Select it and click the *Properties* button.

5: In the Internet Protocol (TCP/IP) Properties window, select *Obtain an IP address*

automatically and Obtain DNS server address automatically as shown on the following screen.



6: Click **OK** to confirm the setting. Your PC will now obtain an IP address automatically from your Hi-Gain Wireless-108G MIMO Router's DHCP server.

Note: Please make sure that the Hi-Gain Wireless-108G MIMO Router's DHCP server is the only DHCP server available on your LAN.

Once you've configured your PC to obtain an IP address automatically, please proceed to Step 3.

2d) Windows NT

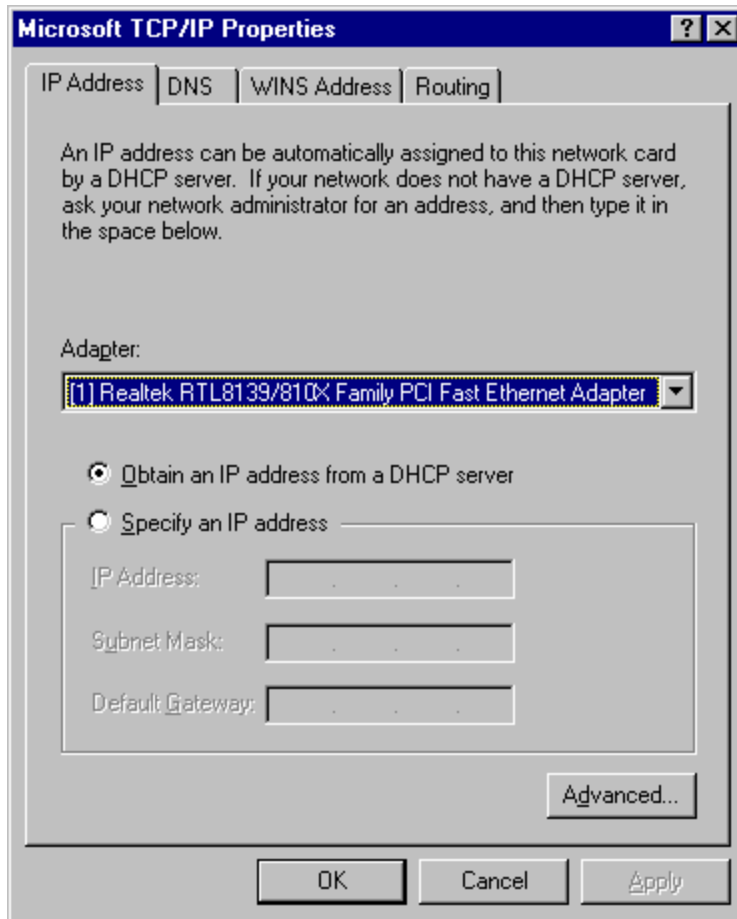
- 1: Click the *Start* button and select *Settings*, then click *Control Panel*. The *Control Panel* window will appear.
- 2: Double-click *Network* icon. The *Network* window will appear. Select the *Protocol* tab from the *Network* window.
- 3: Check if the *TCP/IP Protocol* is on your list of *Network Protocols*. If TCP/IP is not installed, click the *Add* button to install it now. If TCP/IP is installed, go to **step 5**.
- 4: In the *Select Network Protocol* window, select the *TCP/IP Protocol* and click the *Ok*

button to start installing the TCP/IP protocol. You may need your Windows CD to complete the installation.

5: After you install TCP/IP, go back to the *Network* window. Select *TCP/IP* from the list of *Network Protocols* and then click the *Properties* button.

6: Check each of the tabs and verify the following settings:

- **IP Address:** Select *Obtain an IP address from a DHCP server*.
- **DNS:** Let all fields be blank.
- **WINS:** Let all fields be blank.
- **Routing:** Let all fields be blank.



7: Click *OK* to confirm the setting. Your PC will now obtain an IP address automatically from your Hi-Gain Wireless-108G MIMO Router's DHCP server.

Note: Please make sure that the Hi-Gain Wireless-108G MIMO Router's DHCP server is the only DHCP server available on your LAN.

Once you've configured your PC to obtain an IP address automatically, please proceed to Step 3.

Setup Continued...

- 3) Once you have configured your Macs and PCs to obtain an IP address automatically, the router's DHCP server will automatically give your computers an IP address. By default the Hi-Gain Wireless-108G MIMO Router's DHCP server is enabled so that you can obtain an IP address automatically. To see if you have obtained an IP address, see Appendix A.

Note: Please make sure that the Hi-Gain Wireless-108G MIMO Router's DHCP server is the only DHCP server available on your network. If there is another DHCP or router on your network, then you'll need to switch one of the DHCP servers off. (To disable the Hi-Gain Wireless-108G MIMO Router's DHCP server see chapter 2 LAN Port)

- 4) Once your Mac or PC obtains an IP address from your router, enter the default IP address **192.168.1.254** (Hi-Gain Wireless-108G MIMO Router's IP address) into your Mac or PC's web browser and press <enter>



- 5) The login screen below will appear. Enter the "User Name" and "Password" and then click <OK> to login.

Note: By default the user name is "admin" and the password is "1234". For security reasons it is recommended that you change the password as soon as possible (in Advanced menu/system/password, see chapter 2)

A screenshot of a login dialog box. At the top, it says "Default: admin/1234". Below this, there are two input fields: "User name:" and "Password:". The "User name:" field has a dropdown arrow on the right. Below the "Password:" field, there is a checkbox labeled "Remember my password". At the bottom, there are two buttons: "OK" and "Cancel".

- 6) The **HOME** page screen below will appear. The **Home** Page is divided into four sections, **Quick Setup Wizard**, **Advanced Menu**, **Status Information** and **Tools**.

Quick Setup Wizard (Chapter 1)

If you only want to start using the Hi-Gain Wireless-108G MIMO Router as an Internet Access device then you **ONLY** need to configure the screens in the Quick Setup Wizard section.

Advanced Menu (Chapter 2)

If you want to use more advanced features that the Hi-Gain Wireless-108G MIMO Router has to offer, then you'll need to configure the Quick Setup Wizard and the Advanced menu section. Alternatively, you can just configure the Advanced menu section, since the Advanced menu/WAN and the Quick Setup Wizard contain the same configurations.

Status Information *(Chapter 3)*

The Status Information section is for you to monitor the router's current status information only.

Tools *(Chapter 4)*

If you want to Reset the router (because of problems) or save your configurations or upgrade the firmware then the Tools section is the place to do this.



Menu	Description
Quick Setup Wizard <i>(Chapter 1)</i>	Select your Internet connection type and then input the configurations needed to connect to your Internet Service Provider (ISP).
Advanced Menu <i>(Chapter 2)</i>	This section contains configurations for the Hi-Gain Wireless-108G MIMO Router's advance functions such as: Address Mapping, Virtual Server, Access Control, Hacker Attack Prevention, DMZ, Special applications and other functions to meet your LAN requirements.
Status Information <i>(Chapter 3)</i>	In this section you can see the Hi-Gain Wireless-108G MIMO Router's system information,

Internet Connection, Device Status, System Log, Security Log and DHCP client information.

Tools (Chapter 4)

This section contains the Hi-Gain Wireless-108G MIMO Router's Tools - Tools include Configuration tools, Firmware upgrade and Reset. Configuration tools allow you to Backup (save), Restore, or Restore to Factory Default configuration for your Hi-Gain Wireless-108G MIMO Router. The Firmware upgrade tool allows you to upgrade your Hi-Gain Wireless-108G MIMO Router's firmware. The RESET tool allows you to reset your Hi-Gain Wireless-108G MIMO Router.

Logout

Selecting logout will return you to the LOGIN page

-
- 7) Click on **Quick Setup Wizard** (see chapter 1) to start configuring settings required by your ISP so that you can start accessing the Internet. The other sections (Advanced menu, Status Information and Tools) do not need to be configured unless you wish to implement/monitor more advance features/information.

Select the section (Quick Setup Wizard, Advanced menu, Status Information and Tools) you wish to configure and proceed to the corresponding chapter. Use the selections on the web management's top right hand page (see below) to navigate around the web-based management User Interface.



Connecting to the Router from a Mac Computer

To connect to a wireless network from your Mac OS based computer do the following:

Using a AirPort Card or AirPort Extreme Card

3 options:

- Use the AirPort Setup Assistant, Select "Set up your computer to join an existing wireless/AirPort network."
- Mac OS 9 Control strip – Click the AirPort icon and select the network name. It should have a black dot beside it.
- Mac OS X 10.1 or later – Choose your network in either the AirPort menu bar item or in the Internet Connect application.
 - Once you've opened the AirPort menu bar you should see a list of wireless network IDs below the "Turn AirPort Off" selection and "Create Network..." selection. Find your network ID and click it to confirm. This should automatically connect you to your wireless network.

Check Signal Strength

If you feel that your wireless connection loses connection easily or drops its signal from one room to another you can check your real-time signal strength by opening the Airport application (Mac OS 9) or the Internet Connect application (Mac OS X). Try moving around your location and watch the Signal Strength bar increase or decrease.

To obtain a better signal you may:

- 1) Move the router to a location with less interference
- 2) Replace your AirPort card on your computer with a Hawking Hi-Gain Network Adapter for Mac Users.
- 3) Upgrade the antenna on the Wireless-G Router to a Hawking Hi-Gain Antenna or Signal Booster

Built-in Ethernet Users (Wired)

For users with wired connections to a network the same IP changes and settings as wireless apply. Instead of choosing AirPort in your TCP/IP settings you will choose "Ethernet" or "Built-In Ethernet."

Once your IP settings are confirmed you will not need to select a network to join. If all settings are correct you will automatically be joined to your wired network.

Chapter 1

Quick Setup

The Quick Setup section is designed to get you using the Hi-Gain Wireless-108G MIMO Router as quickly as possible. In the Quick Setup you are required to fill in only the information necessary to access the Internet. Once you click on the **Quick Setup Wizard** in the HOME page, you should see the screen below.

Step 1) Time Zone

The Time Zone allows your router to base its time on the settings configured here, this will affect functions such as Log entries and Firewall settings.

The screenshot shows the 'Welcome to the Setup Wizard' screen for a Hawking Technology router. The left sidebar contains a 'WIZARD' menu with options: 1. Time Zone (selected), 2. Broadband Type, and 3. Wireless Setup (with sub-options: Basic Settings and Security Settings). The main content area is titled 'Step 1: Select your Time Zone.' and includes the instruction: 'Set your local time zone. The information will be used for system log entries and your firewall settings.' Below this, there are three input fields: 'Set Time Zone' with a dropdown menu showing '(GMT-08:00)Pacific Time (US & Canada); Tijuana', 'Time Server Address' with a text box containing '192.43.244.18', and 'Daylight Savings' with an 'Enable Function' checkbox and a date range selector set from 'January 1' to 'January 1'. A 'Next' button is located at the bottom right.

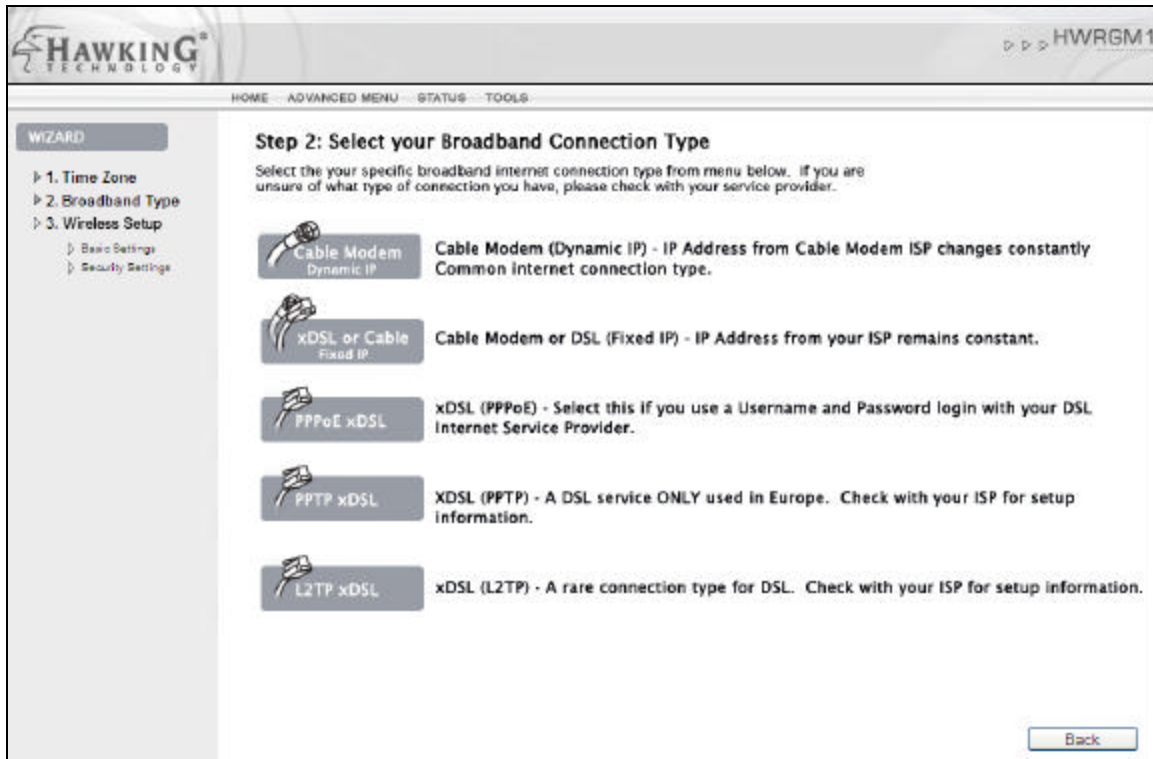
Parameter	Description
Set Time Zone	Select the time zone of the country you are currently in. The router will set its time based on your selection.
Time Server Address	You can manually assign time server address if the default time server dose not work.
Enable Daylight Savings	The router can also take Daylight savings into account. If you wish to use this function, you must check/tick the enable box to enable your daylight saving configuration (below).
Start Daylight Savings Time	Select the period in which you wish to start daylight Savings Time
End Daylight Savings Time	Select the period in which you wish to end daylight Savings Time

Click on **NEXT** to proceed to the next page (step 2) Broadband Type.

Step 2) Broadband Type

In this section you have to select one of four types of connections that you will be using to connect your Hi-Gain Wireless-108G MIMO Router's WAN port to your ISP (see screen below).

Note: Different ISP's require different methods of connecting to the Internet, please check with your ISP as to the type of connection it requires.



Menu	Description
1.1 Cable Modem	Your ISP will automatically give you an IP address
1.2 Fixed-IP xDSL	Your ISP has given you an IP address already
1.3 PPPoE	Your ISP requires you to use a Point-to-Point Protocol over Ethernet (PPPoE) connection.
1.4 PPTP	Your ISP requires you to use a Point-to-Point Tunneling Protocol (PPTP) connection.
1.5 L2TP	Your ISP requires you to use a Layer Two Tunneling Protocol (L2TP) connection.

Click on one of the WAN type and then proceed to the manual's relevant sub-section (**1.1**, **1.2**, **1.3**, **1.4**, **1.5** or **1.6**). Click on **Back** to return to the previous screen.

1.1 Cable Modem

Choose Cable Modem if your ISP will automatically give you an IP address or if you know your connection uses a coax cable as your internet pipeline (cable-TV cable) Some ISP's may also require that you fill in additional information such as Host Name and MAC address (see screen below).

Note: The Host Name and MAC address section is *optional* and you can skip this section if your ISP does not require these settings for you to connect to the Internet.

The screenshot shows the Hawking Technology web interface. At the top, there is a header with the 'HAWKING TECHNOLOGY' logo on the left and 'HWRGM1A' on the right. Below the header is a navigation bar with links: HOME, ADVANCED MENU, STATUS, and TOOLS. On the left side, there is a sidebar with a 'WIZARD' button and three steps: 1.Time Zone, 2.Broadband Type, and 3.IP Address Info. The main content area is titled '3.IP Address Info' and 'Cable Modem'. It contains two input fields: 'Host Name' and 'MAC address'. The 'MAC address' field is pre-filled with '000000000000' and has a 'Clone Mac address' button next to it. At the bottom right are 'Back' and 'OK' buttons.

Parameters	Description
Host Name	If your ISP requires a Host Name, type in the host name provided by your ISP, otherwise leave it blank if your ISP does not require a Host Name.
MAC Address	Your ISP may require a particular MAC address in order for you to connect to the Internet. This MAC address is the PC's MAC address that your ISP had originally connected your Internet connection to. Type in this MAC address in this section or use the " Clone MAC Address " button to replace the WAN MAC address with the MAC address of that PC (you have to be using that PC for the Clone MAC Address button to work). To find out the PC's MAC address see Appendix A. (see Glossary for an explanation on MAC address)

Click <OK> when you have finished the configuration above. **Congratulations!** You have completed the configuration for the Cable Modem connection. You can start using the router now, if you wish to use some of the advance features supported by this router see chapter 2, 3, 4.

1.2 Fixed-IP xDSL or Cable

Select Fixed-IP xDSL if your ISP has given you a specific IP address for you to use. Your ISP should provide all the information required in this section.


The screenshot shows the Hawking Technology router's web interface. At the top, the logo and model number HWRGM1A are visible. A navigation bar includes links for HOME, ADVANCED MENU, STATUS, and TOOLS. On the left, a 'WIZARD' sidebar lists steps: 1.Time Zone, 2.Broadband Type, and 3.IP Address Info (which is highlighted). The main content area is titled '3.IP Address Info' and 'Fixed-IP xDSL'. It instructs the user to enter IP Address, Subnet Mask, Gateway IP Address, and DNS IP Address provided by their ISP. Below this, there are four input fields: 'IP address assigned by your Service Provider' (172.1.1.1), 'Subnet Mask' (255.255.0.0), 'DNS address' (empty), and 'Service Provider Gateway Address' (172.1.1.254). At the bottom right of the form are 'Back' and 'OK' buttons.

Parameters	Description
IP	This is the IP address that your ISP has given you.
Gateway IP	This is the ISP's IP address gateway
DNS	This is the ISP's DNS server IP address
Subnet Mask	Enter the Subnet Mask provided by your ISP (e.g. 255.255.255.0)

Click **<OK>** when you have finished the configuration above. **Congratulations!** You have completed the configuration for the Fixed-IP x DSL connection. You can start using the router now, if you wish to use some of the advance features supported by this router see chapter 2, 3, 4.

1.3 PPPoE

Select PPPoE if your ISP requires the PPPoE protocol to connect you to the Internet. Your ISP should provide all the information required in this section.

3.IP Address Info 

PPPoE

Enter the User Name and Password required by your ISP in the appropriate fields. If your ISP has provided you with a "Service Name" enter it in the Service Name field, otherwise, leave it blank.

Use PPPoE Authentication	
User Name	<input style="width: 150px;" type="text"/>
Password	<input style="width: 150px;" type="password"/>
Service Name	<input style="width: 150px;" type="text"/>
MTU	<input style="width: 80px;" type="text" value="1392"/> (512<=MTU Value<=1492)
Connection Type	<input style="width: 100px;" type="text" value="Continuous"/> <input type="button" value="Connect"/> <input type="button" value="Disconnect"/>
Idle Time Out	<input style="width: 80px;" type="text" value="10"/> (1-1000minutes)

Parameter	Description
User Name	Enter the User Name provided by your ISP for the PPPoE connection
Password	Enter the Password provided by your ISP for the PPPoE connection
Service Name	This is optional. Enter the Service name should your ISP requires it, otherwise leave it blank.
MTU	This is optional. You can specify the maximum size of your transmission packet to the Internet. Leave it as it is if you to not wish to set a maximum packet size.
Connection Type	If you select "Continuous", the router will always connect to the ISP. If the WAN line breaks down and links again, the router will auto-reconnect to the ISP.

If you select “Connect On Demand”, the router will auto-connect to the ISP when someone want to use the Internet and keep connected until the WAN idle timeout. The router will close the WAN connection if the time period that no one is using the Internet exceeds the “Idle Time”.

If you select “Manual”, the router will connect to ISP only when you click “Connect” manually from the Web user interface. The WAN connection will not disconnected due to the idle timeout. If the WAN line breaks down and latter links again, the router will not auto-connect to the ISP.

Idle Time


You can specify an idle time threshold (minutes) for the WAN port. This means if no packets have been sent (no one using the Internet) during this specified period, the router will automatically disconnect the connection with your ISP.

Note: This “idle timeout” function may not work due to abnormal activities of some network application software, computer virus or hacker attacks from the Internet. For example, some software sends network packets to the Internet in the background, even when you are not using the Internet. So please turn off your computer when you are not using it. This function also may not work with some ISP. So please make sure this function can work properly when you use this function in the first time, especially your ISP charge you by time used.

Click <OK> when you have finished the configuration above. **Congratulations!** You have completed the configuration for the PPPoE connection. You can start using the router now, if you wish to use some of the advance features supported by this router see chapter 2, 3, 4.

1.4 PPTP

Select PPTP if your ISP requires the PPTP protocol to connect you to the Internet. Your ISP should provide all the information required in this section.

3.IP Address Info 

PPTP
Point-to-Point Tunneling Protocol is a common connection method used in xDSL connections. To configure your PPTP connection, please fill out the information below.

♦ WAN Interface Settings
☒ Obtain an IP address automatically

Host Name	<input type="text"/>
MAC address	<input type="text" value="000000000000"/> <input type="button" value="Clone Mac address"/>

☐ Use the following IP address

IP address	<input type="text" value="0.0.0.0"/>
Subnet Mask	<input type="text" value="0.0.0.0"/>
Default Gateway	<input type="text" value="0.0.0.0"/>

♦ PPTP Settings

User ID	<input type="text"/>
Password	<input type="password"/>
PPTP Gateway	<input type="text" value="0.0.0.0"/>
Connection ID	<input type="text"/> (Optional)
MTU	<input type="text" value="1392"/> (512<= MTU Value<=1492)
BEZEQ-ISRAEL	<input type="checkbox"/> Enable (for BEZEQ network in ISRAEL use only)
Connection Type	<input type="text" value="Continuous"/> <input type="button" value="Connect"/> <input type="button" value="Disconnect"/>
Idle Time Out	<input type="text" value="10"/> (1-1000minutes)


Parameter	Description
Obtain an IP address automatically	The ISP requires you to obtain an IP address by DHCP before connecting to the PPTP server.
Use the following IP address	The ISP give you a static IP to be used to connect to the PPTP server.
IP Address	This is the IP address that your ISP has given you to establish a PPTP connection.
Subnet Mask	Enter the Subnet Mask provided by your ISP (e.g. 255.255.255.0)
Gateway	Enter the IP address of the ISP Gateway

User ID	Enter the User Name provided by your ISP for the PPTP connection. Sometimes called a Connection ID
Password	Enter the Password provided by your ISP for the PPTP connection
PPTP Gateway	If your LAN has a PPTP gateway, then enter that PPTP gateway IP address here. If you do not have a PPTP gateway then enter the ISP's Gateway IP address above
Connection ID	This is the ID given by ISP. This is optional.
BEZEQ-ISRAEL	Select this item if you are using the service provided by BEZEQ in Israel.
Connection Type	<p>If you select "Continuous", the router will always connect to the ISP. If the WAN line breaks down and links again, the router will auto-reconnect to the ISP.</p> <p>If you select "Connect On Demand", the router will auto-connect to the ISP when someone want to use the Internet and keep connected until the WAN idle timeout. The router will close the WAN connection if the time period that no one is using the Internet exceeds the "Idle Time".</p> <p>If you select "Manual", the router will connect to ISP only when you click "Connect" manually from the Web user interface. The WAN connection will not disconnected due to the idle timeout. If the WAN line breaks down and latter links again, the router will not auto-connect to the ISP.</p>
Idle Time	<p>You can specify an idle time threshold (minutes) for the WAN port. This means if no packets have been sent (no one using the Internet) throughout this specified period, then the router will automatically disconnect the connection with your ISP.</p> <p>Note: This "idle timeout" function may not work due to abnormal activities of some network application software, computer virus or hacker attacks from the Internet. For example, some software sends network packets to the Internet in the background, even when you are not using the Internet. So please turn off your computer when you are not using it. This function also may not work with some ISP. So please make sure this function can work properly when you use this function in the first time, especially your ISP charge you by time used.</p>

Click <OK> when you have finished the configuration above. **Congratulations!** You have completed the configuration for the PPTP connection. You can start using the router now, if you wish to use some of the advance features supported by this router see chapter 2, 3, 4.

1.5 L2TP

Select L2TP if your ISP requires the L2TP protocol to connect you to the Internet. Your ISP should provide all the information required in this section.

3.IP Address Info 

L2TP
Layer Two Tunneling Protocol is a common connection method used in xDSL connections. To configure your L2TP connection, please fill out the information below

♦ WAN Interface Settings

☒ Obtain an IP address automatically

Host Name

MAC address

000000000000

Clone Mac address

☐ Use the following IP address

IP address

0.0.0.0

Subnet Mask

0.0.0.0

Default Gateway

0.0.0.0

♦ L2TP Settings

User ID

Password

L2TP Gateway

MTU

1392

(512<=MTU Value<=1492)

Connection Type

Continuous

Connect

Disconnect

Idle Time Out

10

(1-1000 minutes)

Back

OK

Parameter	Description
Obtain an IP address automatically	The ISP requires you to obtain an IP address by DHCP before connecting to the L2TP server.
MAC Address	Your ISP may require a particular MAC address in order for you to connect to the Internet. This MAC address is the PC's MAC address that your ISP had originally connected your Internet connection to. Type in this MAC address in this section or use the "Clone MAC Address" button to

replace the WAN MAC address with the MAC address of that PC (you have to be using that PC for the Clone MAC Address button to work). To find out the PC's MAC address see Appendix A. (see Glossary for an explanation on MAC address)

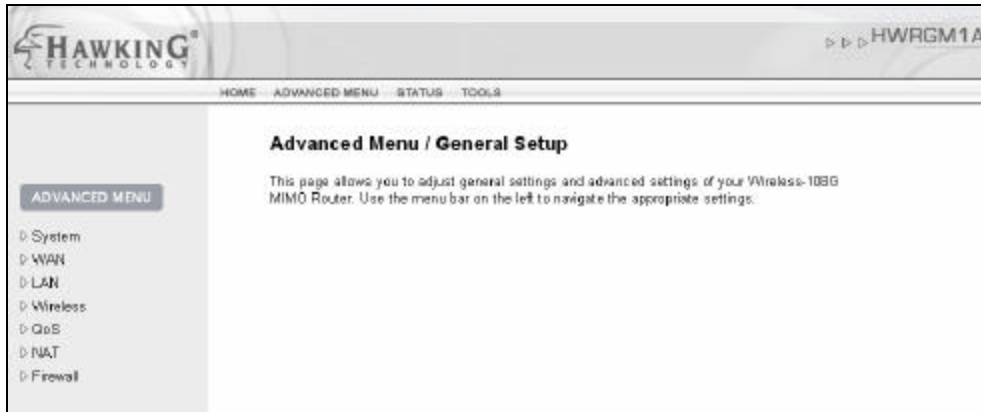
Use the following IP address	The ISP gives you a static IP to be used to connect to the L2TP server.
IP Address	This is the IP address that your ISP has given you to establish a L2TP connection.
Subnet Mask	Enter the Subnet Mask provided by your ISP (e.g. 255.255.255.0)
Gateway	Enter the IP address of the ISP Gateway
User ID	Enter the User Name provided by your ISP for the PPTP connection. Sometimes called a Connection ID
Password	Enter the Password provided by your ISP for the PPTP connection
L2TP Gateway	If your LAN has a L2TP gateway, then enter that L2TP gateway IP address here. If you do not have a L2TP gateway then enter the ISP's Gateway IP address above
MTU	This is optional. You can specify the maximum size of your transmission packet to the Internet. Leave it as it is if you do not wish to set a maximum packet size.
Connection Type	<p>If you select "Continuous", the router will always connect to the ISP. If the WAN line breaks down and links again, the router will auto-reconnect to the ISP.</p> <p>If you select "Connect On Demand", the router will auto-connect to the ISP when someone want to use the Internet and keep connected until the WAN idle timeout. The router will close the WAN connection if the time period that no one is using the Internet exceeds the "Idle Time".</p> <p>If you select "Manual", the router will connect to ISP only when you click "Connect" manually from the Web user interface. The WAN connection will not be disconnected due to the idle timeout. If the WAN line breaks down and latter links again, the router will not auto-connect to the ISP.</p>
Idle Time Out	The WAN "idle timeout" auto-disconnect function may not work due to abnormal activities of some network application software, computer virus or hacker attacks from the Internet. For example,

some software sends network packets to the Internet in the background, even when you are not using the Internet. This function also may not work with some ISP. So please make sure this function can work properly when you use this function in the first time, especially your ISP charge you by time used. Due to the many uncontrollable issues, we do not guarantee the WAN "idle timeout" auto-disconnect function will always work. In order to prevent from extra fee charged by ISP, please **TURN OFF THE ROUTER WHEN YOU FINISHED USING THE INTERNET.**

Click **<OK>** when you have finished the configuration above. **Congratulations!** You have completed the configuration for the L2TP connection. You can start using the router now, if you wish to use some of the advance features supported by this router see chapter 2, 3, 4.

Chapter 2

Advanced Menu



Once you click on the **Advanced menu** button at the Home Page, you should see the screen above.

If you have already configured your router using the Quick Setup Wizard you do NOT need to configure anything thing in the Advanced menu screen to start using the Internet.

The Advanced menu contains advanced features that allow you to configure the router to meet your network's needs such as: Wireless, Address Mapping, Virtual Server, Access Control, Hacker Attack Prevention, Special Applications, DMZ and other functions.

Below is a general description of what advance functions are available for this Hi-Gain Wireless-108G MIMO Router.

Menu	Description
2.1 System	This section allows you to set the Hi-Gain Wireless-108G MIMO Router's system Time Zone, Password and Remote Management Administrator.
2.2 WAN	This section allows you to select the connection method in order to establish a connection with your ISP (same as the Quick Setup Wizard section)
2.3 LAN	You can specify the LAN segment's IP address, subnet Mask, enable/disable DHCP and select an IP range for your LAN
2.4 Wireless	You can setup the wireless LAN's SSID, WEP key, MAC filtering.

2.5 QoS

You can setup the QoS bandwidth control policy.

2.6 NAT

You can configure the Address Mapping, Virtual Server and Special Applications functions in this section. This allows you to specify what user/packet can pass your router's NAT.

2.7 Firewall

The Firewall section allows you to configure Access Control, Hacker Prevention and DMZ.

Select one of the above five Advanced menu selections and proceed to the manual's relevant sub-section

2.1 System

The system screen allows you to specify a time zone, to change the system password and to specify a remote management user for the Hi-Gain Wireless-108G MIMO Router.



Parameters	Description
<i>System Settings</i>	
2.1.1 Time Zone	Select the time zone of the country you are currently in. The router will set its time based on your selection.
2.1.2 Password Settings	Allows you to select a password in order to access the web-based management website.
2.1.3 Remote Management	You can specify a Host IP address that can perform remote management functions.
Select one of the above three system settings selections and proceed to the manual's relevant sub-section	

2.1.1 Time Zone

The Time Zone allows your router to reference or base its time on the settings configured here, which will affect functions such as Log entries and Firewall settings.

Parameter	Description
Set Time Zone	Select the time zone of the country you are currently in. The router will set its time based on your selection.
Time Server Address	The router default the “Time Server Address” is “192.43.244.18”
Enable Daylight Savings	The router can also take Daylight savings into account. If you wish to use this function, you must check/tick the enable box to enable your daylight saving configuration (below).
Start Daylight Savings Time	Select the period in which you wish to start daylight Savings Time
End Daylight Savings Time	Select the period in which you wish to end daylight Savings Time

Click **<Apply>** at the bottom of the screen to save the above configurations. You can now configure other advance sections or start using the router (with the advance settings in place)

2.1.2 Password Settings

You can change the password required to log into the Hi-Gain Wireless-108G MIMO Router's system web-based management. By default, there is no password. So please assign a password to the Administrator as soon as possible, and store it in a safe place. Passwords can contain 0 to 12 alphanumeric characters, and are case sensitive.

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HOME ADVANCED MENU STATUS TOOLS

Login and Password Settings

You may change the password required to log into the Wireless-108G MIMO Router's web-based management utility. By default, the password is 1234. Your new password can contain up to 30 alphanumeric characters and is case sensitive. After changing your password, be sure to store it in a safe place. If you happen to lose your password you will need to reset your router to default settings using the hardware reset button on the back of the router.

Current Password
New Password
Confirmed Password

ADVANCED MENU

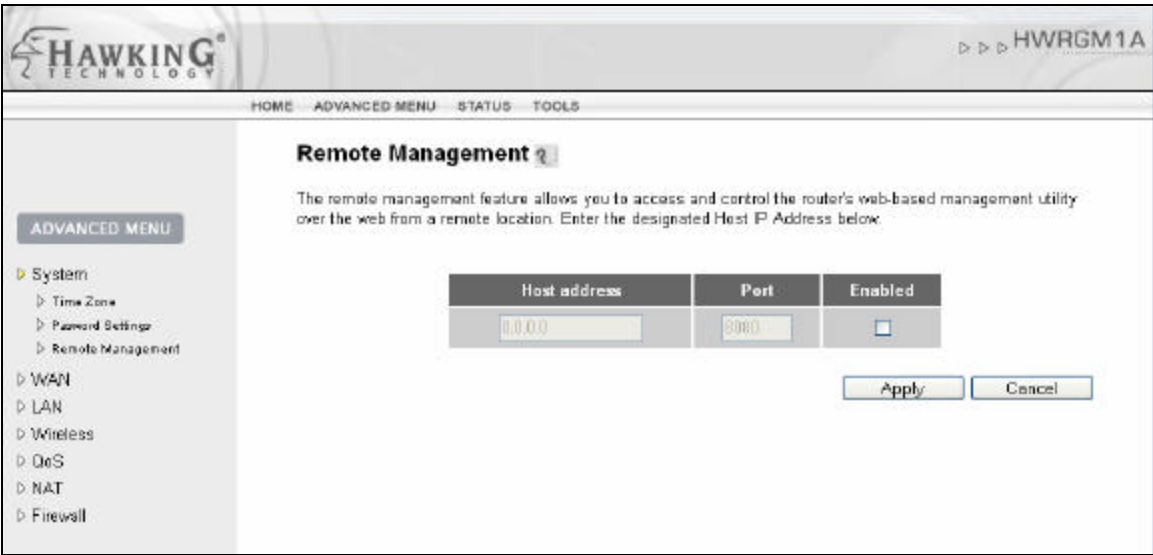
- System
 - Time Zone
 - Password Settings
 - Remote Management
- WAN
- LAN
- Wireless
- QoS
- NAT
- Firewall

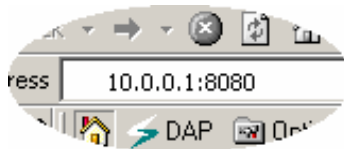
Parameters	Description
Current Password	Enter your current password for the remote management administrator to login to your Hi-Gain Wireless-108G MIMO Router. Note: By default there is NO password
New Password	Enter your new password
Confirmed Password	Enter your new password again for verification purposes Note: If you forget your password, you'll have to reset the router to the factory default (No password) with the reset button (see router's back panel)

Click **<Apply>** at the bottom of the screen to save the above configurations. You can now configure other menu options or start using the router (with the advance settings in place)

2.1.3 Remote Management

The remote management function allows you to designate a host in the Internet the ability to configure the Hi-Gain Wireless-108G MIMO Router from a remote site. Enter the designated host IP Address in the Host IP Address field.

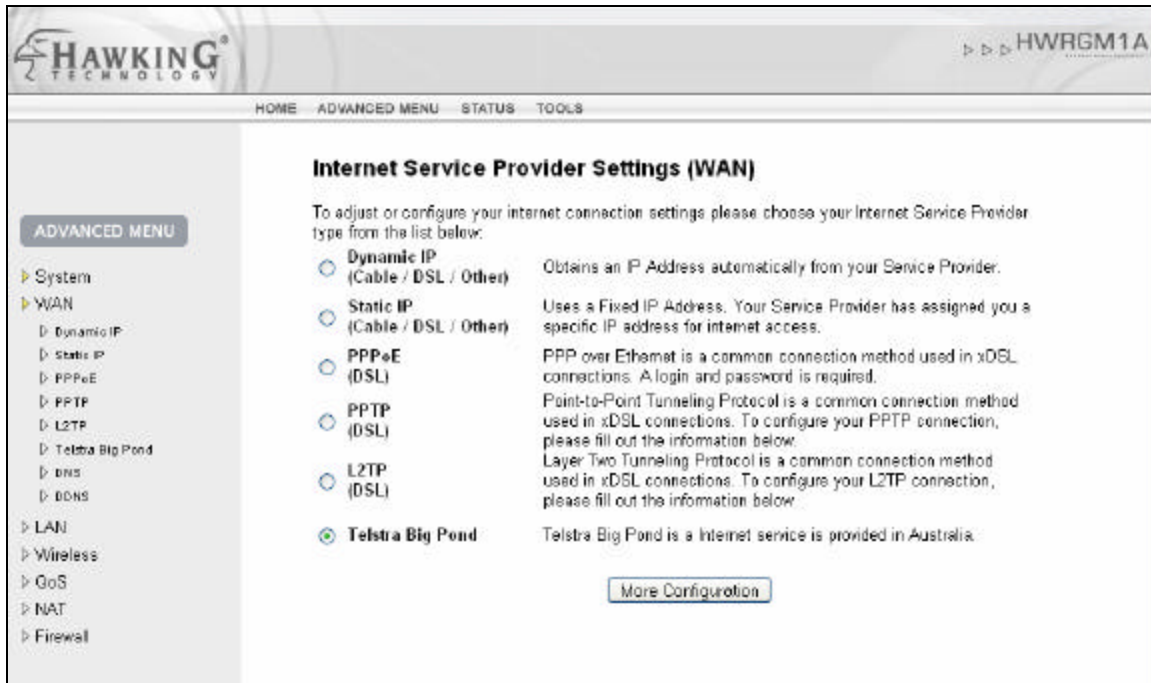


Parameters	Description
Host Address	<p>This is the IP address of the host in the Internet that will have management/configuration access to the Hi-Gain Wireless-108G MIMO Router from a remote site. This means if you are at home and your home IP address has been designated the Remote Management host IP address for this router (located in your company office), then you are able to configure this router from your home. If the Host Address is left 0.0.0.0 this means anyone can access the router's web-based configuration from a remote location, providing they know the password.</p> <p>Click the Enabled box to enable the Remote Management function.</p> <p>Note: When you want to access the web-based management from a remote site, you must enter the router's WAN IP address (e.g. 10.0.0.1) into your web-browser followed by port number 8080, e.g. 10.0.0.1:8080 (see below). You'll also need to know the password set in the Password Setting screen in order to access the router's web-based management.</p> 
Port	The port number of remote management web interface.
Enabled	Select "Enabled" to enable the remote management function.

Click <**Apply**> at the bottom of the screen to save the above configurations. You can now configure other advance sections or start using the router (with the advance settings in place)

2.2 WAN

Use the WAN Settings screen if you have already configured the Quick Setup Wizard section and you would like to change your Internet connection type. The WAN Settings screen allows to specify the type of WAN port connect you want to establish with your ISP. The WAN settings offer the following selections for the router's WAN port, **Dynamic IP**, **Static IP Address**, **PPPoE**, **PPTP**, **L2TP**, **DNS** and **DDNS**.



Parameters	Description
2.2.1 Dynamic IP address	Your ISP will automatically give you an IP address
2.2.2 Static IP address	Your ISP has given you an IP address already
2.2.3 PPPoE	Your ISP requires PPPoE connection.
2.2.4 PPTP	Your ISP requires you to use a Point-to-Point Tunneling Protocol (PPTP) connection.
2.2.5 L2TP	Your ISP requires L2TP connection.
2.2.6 Telstra Big Pond	Your ISP requires Telstra Big Pond connection.
2.2.7 DNS	You can specify a DNS server that you wish to use
2.2.8 DDNS	You can specify a DDNS server that you wish to use and configure the user name and password provided by you DDNS service provider.

Once you have made a selection, click **<More Configuration>** at the bottom of the screen and proceed to the manual's relevant sub-section

2.2.1 Dynamic IP

Choose the Dynamic IP selection if your ISP will automatically give you an IP address. Some ISP's may also require that you fill in additional information such as Host Name, Domain Name and MAC address (see chapter 1 "Cable Modem" for more detail)

2.2.2 Static IP Address

Select Static IP address if your ISP has given you a specific IP address for you to use. Your ISP should provide all the information required in this section. (See chapter 1 "Fixed IP" for more detail)

2.2.3 PPPoE (PPP over Ethernet)

Select PPPoE if your ISP requires the PPPoE protocol to connect you to the Internet. Your ISP should provide all the information required in this section. (See chapter 1 "PPPoE" for more detail)

2.2.4 PPTP

Select PPTP if your ISP requires the PPTP protocol to connect you to the Internet. Your ISP should provide all the information required in this section. (See chapter 1 "PPTP" for more detail)

2.2.5 L2TP

Select L2TP if your ISP requires the L2TP protocol to connect you to the Internet. Your ISP should provide all the information required in this section. (See chapter 1 "L2TP" for more detail)

2.2.6 Telstra Big Pond

Select Telstra Big Pond if your ISP requires the Telstra Big Pond protocol to connect you to the Internet. Your ISP should provide all the information required in this section. Telstra Big Pond protocol is used by the ISP in Australia. (See chapter 1 "Telstra Big Pond" for more detail)

2.2.7 DNS

A Domain Name System (DNS) server is like an index of IP addresses and Web addresses. If you type a Web address into your browser, such as www.router.com, a DNS server will find that name in its index and the matching IP address. Most ISPs provide a DNS server for speed and convenience. If your Service Provider connects you to the Internet with dynamic IP settings, it is likely that the DNS server IP address is provided automatically. However, if there is a DNS server that you would rather use, you need to specify the IP address of that DNS server here.

The screenshot shows the Hawking Technology HWRGM1A web interface. The top navigation bar includes 'HOME', 'ADVANCED MENU', 'STATUS', and 'TOOLS'. The left sidebar, titled 'ADVANCED MENU', lists various configuration options: System, WAN, LAN, Wireless, GoS, NAT, and Firewall. The main content area is titled 'DNS - Domain Name System' and contains a descriptive paragraph about DNS. Below the text are two input fields: 'DNS address' and 'Secondary DNS Address (optional)'. At the bottom right of the form are 'Apply' and 'Cancel' buttons.

Parameters	Description
Domain Name Server (DNS) Server	This is the ISP's DNS server IP address that they gave you; or you can specify your own preferred DNS server IP address
Secondary DNS Address (optional)	This is optional. You can enter another DNS server's IP address as a backup. The secondary DNS will be used should the above DNS fail.

Click **<Apply>** at the bottom of the screen to save the above configurations. You can now configure other advance sections or start using the router (with the advance settings in place)

2.2.8 DDNS

DDNS allows you to map the static domain name to a dynamic IP address. You must get an account, password and your static domain name from the DDNS service providers. This router supports DynDNS, TZO and other common DDNS service providers.

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DDNS

DDNS allows users to map the static domain name to a dynamic IP address. You must get an account, password and your static domain name from the DDNS service providers. Our products have DDNS support for www.dyndns.org and www.tzo.com.

Dynamic DNS ☐ Enabled ☒ Disabled

Provider DynDNS

Domain Name

Account / E Mail

Password / Key

Apply Cancel

Parameters	Default	Description
Enable/Disable	Disable	Enable/Disable the DDNS function of this router
Provider		Select a DDNS service provider
Domain name		Your static domain name that use DDNS
Account/E- mail		The account that your DDNS service provider assigned to you
Password/Key		The password you set for the DDNS service account above

Click <**Apply**> at the bottom of the screen to save the above configurations. You can now configure other advance sections or start using the router (with the advance settings in place)

2.3 LAN

The LAN Port screen below allows you to specify a private IP address for your router's LAN ports as well as a subnet mask for your LAN segment.

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HOME ADVANCED MENU STATUS TOOLS

LAN Settings (Local Area Network)

You can configure your local area network settings here as well as define the IP address for your router within your local network. The IP address you define for your router will be the IP address you must type into a web address bar to access this web-based management utility. You may also enable or disable the DHCP server here. The DHCP server automatically assigns IP addresses to new users that log into your network.

LAN IP

IP address	10.1.1.241
Subnet Mask	255.255.255.0
802.1d Spanning Tree	Disabled
DHCP Server	Disabled

DHCP Server

Lease Time	Forever
Start IP	192.168.2.100
End IP	192.168.2.200
Domain Name	

Apply Cancel

Parameters	Default	Description
LAN IP		
IP address	192.168.1.254	This is the router's LAN port IP address (Your LAN clients default gateway IP address)
IP Subnet Mask	255.255.255.0	Specify a Subnet Mask for your LAN segment
802.1d Spanning Tree	Disabled	If 802.1d Spanning Tree function is enabled, this router will use the spanning tree protocol to prevent from network loop happened in the LAN ports.
DHCP Server	Enabled	You can enable or disable the DHCP server. By enabling the DHCP server the router will automatically give your LAN clients an IP address. If the DHCP is not enabled then you'll have to manually set your LAN client's IP addresses; make sure the LAN Client is in the same subnet as this Hi-Gain Wireless-108G

MIMO Router if you want the router to be your LAN client's default gateway

Lease Time

The DHCP when enabled will temporarily give your LAN clients an IP address. In the Lease Time setting you can specify the time period that the DHCP lends an IP address to your LAN clients. The DHCP will change your LAN client's IP address when this time threshold period is reached

IP Address Pool

You can select a particular IP address range for your DHCP server to issue IP addresses to your LAN Clients.

Note: By default the IP range is from: Start IP **192.168.1.25400** to End IP **192.168.1.25499**. If you want your PC to have a static/fixed IP address then you'll have to choose an IP address outside this IP address Pool

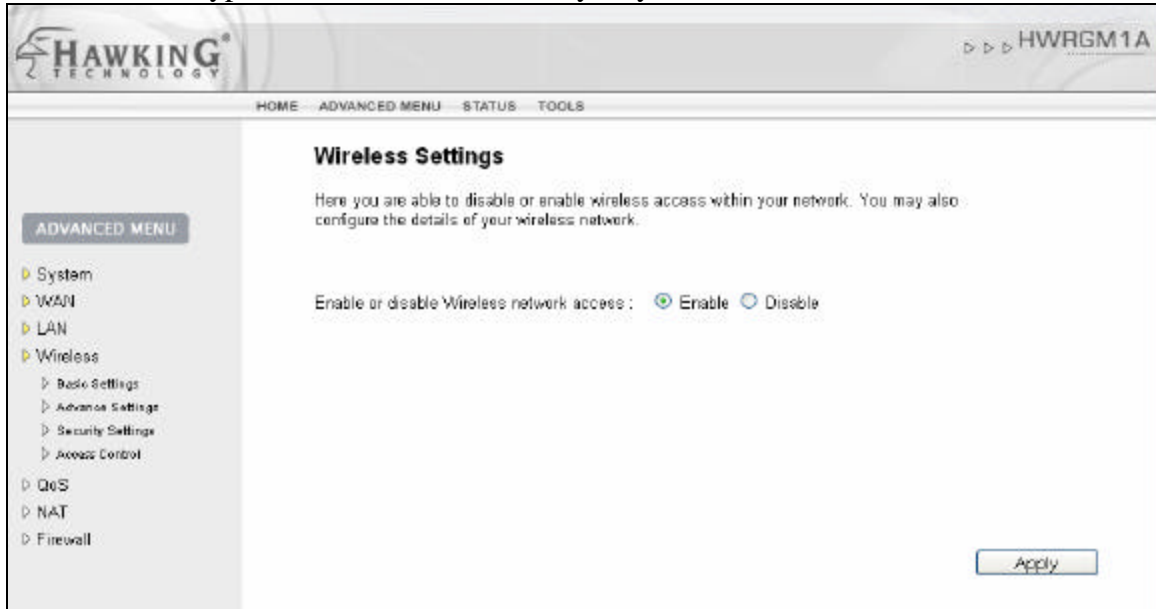
Domain Name

You can specify a Domain Name for your LAN

Click **<Apply>** at the bottom of the screen to save the above configurations. You can now configure other advance sections or start using the router (with the advance settings in place)

2.4 Wireless

Wireless Access Point builds a wireless LAN and can let all PCs equipped with IEEE 802.11b or 801.11g wireless network adaptor connect to your Intranet. It supports WEP and WPA2 encryption to enhance the security of your wireless network.



Parameters	Default	Description
Enable or disable Wireless module function	Enable	You can select to enable or disable the wireless access point module of this router.

Click **<Apply>** at the bottom of the screen to save the above configurations. You can now configure other advance sections or start using the router (with the advance settings in place)

2.4.1 Basic Settings

You can set parameters that are used for the wireless stations to connect to this router. The parameters include Mode, ESSID, Channel Number.

Wireless Modes: AP Mode – Default Setting

The AP Mode allows your system to act as a wireless access point for other computers to connect to for network/internet access. This is the typical setting of most wireless networks. Do not change this if you are not aware of the outcome.

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HOME ADVANCED MENU STATUS TOOLS

Wireless Settings

This page allows you to define the Identification name of your wireless connection (ESSID), and the wireless operating channel for the wireless connection. All computers connecting to your network will use the identification name set here to find your network. The band selection is for setting your wireless router to operate in 802.11b mode only, 802.11g mode only or both together (recommended)

Mode: AP

Band: 11

ESSID: HWRGM1A

Channel Number: 11

Apply Cancel

Airport Express™ Client Mode Configuration

If you have an Airport Express that you'd like to use in conjunction with the Hawking MIMO Router simply set the Airport Express into Client Mode and connect wirelessly to the Hawking Router based on the SSID that you have set for the router. i-Tunes™ audio streaming is supported by the Hawking Wireless Router through the Airport Express™. The Hawking router must be set on AP mode for the Airport Express to connect to it.

i-Tunes™ and Airport Express™ are trademarks of Apple Computers, Inc. No affiliation is implied or expressed.

Wireless Modes: AP Bridge-Point to Point

Wireless Settings

This page allows you to define the Identification name of your wireless connection (ESSID), and the wireless operating channel for the wireless connection. All computers connecting to your network will use the identification name set here to find your network. The band selection is for setting your wireless router to operate in 802.11b mode only, 802.11g mode only or both together (recommended)

Mode:	AP Bridge-Point to Point
Band :	2.4 GHz (B+G)
Channel Number :	11
MAC address 1 :	000000000000
Set Security :	Set Security

ApplyCancel

AP Bridge-Point to Point mode allows you to add another Hawking HWRGM1A to your network to act as a wireless relay to another section of your home. To do this you will need to enter the MAC address of the HWRGM1A that you are adding into your network. To find the MAC address of your router simply go to STATUS from the top menu in the web interface. Click on Device Status from the left navigation bar. View the MAC Address information in this section.

You can then copy and paste this information into the “Main” router that is currently connected to your broadband connection and use the other to repeat your network.

The Airport Express may also work using this mode by entering the **Airport ID** in place of the MAC Address. However this is not always guaranteed to work.

Wireless Modes: AP Bridge-Point to Multi-Point

Wireless Settings

This page allows you to define the Identification name of your wireless connection (ESSID), and the wireless operating channel for the wireless connection. All computers connecting to your network will use the identification name set here to find your network. The band selection is for setting your wireless router to operate in 802.11b mode only, 802.11g mode only or both together (recommended)

Mode:	AP Bridge-Point to Multi-Point
Band :	2.4 GHz (B+G)
Channel Number :	11
MAC address 1 :	000000000000
MAC address 2 :	000000000000
MAC address 3 :	000000000000
MAC address 4 :	000000000000
Set Security :	Set Security

ApplyCancel

AP Bridge-Point to Multi Point mode allows you to add a few Hawking HWRGM1A's to your network to act as a wireless relay to other sections within your home. To do this you will need to enter the MAC addresses of the HWRGM1A's that you will be adding into your network. To find the MAC address of your router simply go to STATUS from the top menu in the web interface. Click on Device Status from the left navigation bar. View the MAC Address information in this section.

You can then copy and paste this information into the "Main" router that is currently connected to your broadband connection and use the other to repeat your network.

The Airport Express may also work using this mode by entering the **Airport ID** in place of the MAC Address. However this is not always guaranteed to work.

Wireless Modes: AP Bridge-WDS

Wireless Settings

This page allows you to define the Identification name of your wireless connection (ESSID), and the wireless operating channel for the wireless connection. All computers connecting to your network will use the identification name set here to find your network. The band selection is for setting your wireless router to operate in 802.11b mode only, 802.11g mode only or both together (recommended)

Mode:	AP Bridge-WDS
Band :	2.4 GHz (B+G)
ESSID :	HWR54GM
Channel Number :	11
MAC address 1 :	000000000000
MAC address 2 :	000000000000
MAC address 3 :	000000000000
MAC address 4 :	000000000000
Set Security:	Set Security

ApplyCancel

AP Bridge-WDS mode allows you to add another Hawking HWRGM1A to your network to act as a wireless relay to another section of your home. To do this you will need to enter the MAC address of the HWRGM1A that you are adding into your network. To find the MAC address of your router simply go to STATUS from the top menu in the web interface. Click on Device Status from the left navigation bar. View the MAC Address information in this section.

You can then copy and paste this information into the “Main” router that is currently connected to your broadband connection and use the other to repeat your network.

The Airport Express may also work using this mode by entering the **Airport ID** in place of the MAC Address. However this is not always guaranteed to work.

Parameters	Default	Description
Mode		It allows you to set the AP to AP, Bridge or WDS mode.
Band		It allows you to set the AP fix at 802.11b or 802.11g mode. You also can select B+G mode to allow the AP select 802.11b and 802.11g connection automatically.
ESSID	default	This is the name of the wireless LAN. All the devices in the same wireless LAN should have the same ESSID.
Channel Number	11	The channel used by the wireless LAN. All devices in the same wireless LAN should use the same channel.
MAC address		If you want to bridge more than one networks together with wireless LAN, you have to set this access point to "AP Bridge-Point to Point mode", "AP Bridge-Point to Multi-Point mode" or "AP Bridge-WDS mode". You have to enter the MAC addresses of other access points that join the bridging work.
Set Security		Click the "Set Security" button, then a "WDS Security Settings" will pop up. You can set the security parameters used to bridge access points together here when your AP is in AP Bridge modes. You can refer to section 4.3 "Security Settings" for how to set the parameters.

Click **<Apply>** at the bottom of the screen to save the above configurations. You can now configure other advance sections or start using the router (with the advance settings in place)

2.4.2 Advanced Settings

You can set advanced wireless LAN parameters of this router. The parameters include Authentication Type, Fragment Threshold, RTS Threshold, Beacon Interval, Preamble Type You should not change these parameters unless you know what effect the changes will have on this router.

Advanced Settings

These settings are only for more technically advanced users who have a sufficient knowledge about wireless networks. These settings should not be changed unless you know what effect the changes will have on your wireless network.

Fragment Threshold:	<input type="text" value="2346"/>	(256-2346)
RTS Threshold:	<input type="text" value="2347"/>	(0-2347)
Beacon Interval:	<input type="text" value="100"/>	(20- 1024 ms)
DTIM Period:	<input type="text" value="3"/>	(1-10)
Data Rate:	<input type="button" value="Auto"/>	
Preamble Type:	<input checked="" type="radio"/> Short Preamble	<input type="radio"/> Long Preamble
Broadcast Essid :	<input checked="" type="radio"/> Enable	<input type="radio"/> Disable
CTS Protect:	<input type="radio"/> Auto	<input type="radio"/> Always <input checked="" type="radio"/> None
Tx Power:	<input type="button" value="100 %"/>	
Turbo Mode:	<input checked="" type="radio"/> Enable	<input type="radio"/> Disable
WMM :	<input type="radio"/> Enable	<input checked="" type="radio"/> Disable

Parameters	Default	Description
Fragment Threshold		"Fragment Threshold" specifies the maximum size of packet during the fragmentation of data to be transmitted. If you set this value too low, it will result in bad performance.
RTS Threshold		When the packet size is smaller the RTS threshold, the wireless router will not use the RTS/CTS mechanism to send this packet.
Beacon Interval		The interval of time that this wireless router broadcast a beacon. Beacon is used to synchronize the wireless network.

DTIM Period	The DTIM period you specify here indicates how often the clients served by this access point should check for buffered data still on the AP awaiting pickup.
Data Rate	The “Data Rate” is the rate this access point uses to transmit data packets. The access point will use the highest possible selected transmission rate to transmit the data packets.
Preamble Type	The “Long Preamble” can provide better wireless LAN compatibility while the “Short Preamble” can provide better wireless LAN performance.
Broadcast ESSID	If you enable “Broadcast ESSID”, every wireless station located within the coverage of this access point can discover this access point easily. If you are building a public wireless network, enabling this feature is recommended. Disabling “Broadcast ESSID” can provide better security.
CTS Protection	It is recommended to enable the protection mechanism. This mechanism can decrease the rate of data collision between 802.11b and 802.11g wireless stations. When the protection mode is enabled, the throughput of the AP will be a little lower due to many of frame traffic should be transmitted.

Click <**Apply**> at the bottom of the screen to save the above configurations. You can now configure other advance sections or start using the router.

2.4.3 Security

This Access Point provides complete wireless LAN security functions, include WEP, IEEE 802.11x, IEEE 802.11x with WEP, WPA with pre-shared key and WPA with RADIUS. With these security functions, you can prevent your wireless LAN from illegal access. Please make sure your wireless stations use the same security function.

2.4.3.1 WEP only

When you select 64-bit or 128-bit WEP key, you have to enter WEP keys to encrypt data. You can generate the key by yourself and enter it. You can enter four WEP keys and select one of them as default key. Then the router can receive any packets encrypted by one of the four keys

Security Settings

This page allows you to set wireless security within your network. Wireless Security prevents outside intruders from entering your wireless network freely. The Hawking Wireless-108G MIMO Router features several types of wireless security, ranging from low to high. WEP is the basic type while WPA is more advanced. Consult the users manual if you are unsure how to setup your wireless security.

Encryption :	WEP
Key Length :	64-bit
Key Format :	Hex (10 characters)
Default Tx Key :	Key2
Encryption Key 1 :	<input type="text"/>
Encryption Key 2 :	<input type="text"/>
Encryption Key 3 :	<input type="text"/>
Encryption Key 4 :	<input type="text"/>

☐ Enable 802.1x Authentication

Apply Cancel

Parameters	Default	Description
Key Length	64-bit	You can select the WEP key length for encryption, 64-bit or 128-bit. Larger WEP key length will provide higher level of security, but the throughput will be lower.

Key Format

You may select to select ASCII Characters (alphanumeric format) or Hexadecimal Digits (in the "A-F", "a-f" and "0-9" range) to be the WEP Key.

For example:

ASCII Characters: guest

Hexadecimal Digits: 12345abcde

Default Key

Select one of the four keys to encrypt your data. Only the key you select it in the "Default key" will take effect.

Key 1 - Key 4

The WEP keys are used to encrypt data transmitted in the wireless network. Fill the text box by following the rules below.

64-bit WEP: input 10-digit Hex values (in the "A-F", "a-f" and "0-9" range) or 5-digit ASCII character as the encryption keys.

128-bit WEP: input 26-digit Hex values (in the "A-F", "a-f" and "0-9" range) or 13-digit ASCII characters as the encryption keys.

Click **<Apply>** at the bottom of the screen to save the above configurations. You can now configure other advance sections or start using the router (with the advance settings in place)

2.4.3.2 802.1x only

IEEE 802.1x is an authentication protocol. Every user must use a valid account to login to this Access Point before accessing the wireless LAN. The authentication is processed by a RADIUS server. This mode only authenticates user by IEEE 802.1x, but it does not encryption the data during communication.

Parameters	Default	Description
RADIUS Server IP address		The IP address of external RADIUS server.
RADIUS Server Port		The service port of the external RADIUS server.
RADIUS Server Password		The password used by external RADIUS server.

Click **<Apply>** at the bottom of the screen to save the above configurations. You can now configure other advance sections or start using the router (with the advance settings in place)

2.4.3.3 802.1x WEP Static key

IEEE 802.1x is an authentication protocol. Every user must use a valid account to login to this Access Point before accessing the wireless LAN. The authentication is processed by a RADIUS server. This mode also uses WEP to encrypt the data during communication.

HAWKING TECHNOLOGY HWRGM1A

HOME ADVANCED MENU STATUS TOOLS

Security Settings

This page allows you to set wireless security within your network. Wireless Security prevents outside intruders from entering your wireless network freely. The Hawking Wireless-100G MIMO Router features several types of wireless security, ranging from low to high. WEP is the basic type while WPA is more advanced. Consult the users manual if you are unsure how to setup your wireless security.

ADVANCED MENU

- System
- WAN
- LAN
- Wireless
 - Basic Settings
 - Advanced Settings
 - Security Settings
 - Access Control
- QoS
- NAT
- Firewall

Encryption :	WEP
Key Length :	64-bit
Key Format :	Hex (10 characters)
Default Tx Key :	Key2
Encryption Key 1 :	
Encryption Key 2 :	
Encryption Key 3 :	
Encryption Key 4 :	

☒ Enable 802.1x Authentication

RADIUS Server IP address :	
RADIUS Server Port :	1812
RADIUS Server Password :	

Apply Cancel

For the WEP settings, please refer to section 2.4.3.1 “WEP only”. For the 802.1x settings, please refer to section 2.4.3.2 “802.1x only”.

2.4.3.4 WPA Pre-shared key

Wi-Fi Protected Access (WPA) is an advanced security standard. You can use a pre-shared key to authenticate wireless stations and encrypt data during communication. It uses TKIP or CCMP(AES) to change the encryption key frequently. So the encryption key is not easy to be broken by hackers. This can improve security very much.

d

Parameters	Default	Description
WPA(TKIP)		TKIP can change the encryption key frequently to enhance the wireless LAN security.
WPA2(AES)		This use CCMP protocol to change encryption key frequently. AES can provide high level encryption to enhance the wireless LAN security.
WPA2 Mixed		This will use TKIP or AES based on the other communication peer automatically.
Pre-shared Key Format		You may select to select Passphrase (alphanumeric format) or Hexadecimal Digits (in the “A-F”, “a-f” and “0-9” range) to be the Pre-shared Key. For example: Passphrase: iamguest Hexadecimal Digits: 12345abcde
Pre-shared Key		The Pre-shared key is used to authenticate and encrypt data transmitted in the wireless network.

Fill the text box by following the rules below.
Hex WEP: input 64-digit Hex values (in the “A-F”, “a-f” and “0-9” range) or at least 8 character pass phrase as the pre-shared keys.

Click **<Apply>** at the bottom of the screen to save the above configurations. You can now configure other advance sections or start using the router (with the advance settings in place)

2.4.3.5 WPA Radius

Wi-Fi Protected Access (WPA) is an advanced security standard. You can use an external RADIUS server to authenticate wireless stations and provide the session key to encrypt data during communication. It uses TKIP or CCMP(AES) to change the encryption key frequently. This can improve security very much.

The screenshot shows the Hawking Router's web interface. The top navigation bar includes 'HOME', 'ADVANCED MENU', 'STATUS', and 'TOOLS'. The 'ADVANCED MENU' is expanded, showing options like System, WAN, LAN, Wireless, QoS, NAT, and Firewall. The 'Wireless' section is selected, and the 'Security Settings' page is displayed. The page title is 'Security Settings'. Below the title, there is a descriptive paragraph about wireless security. The main configuration area contains several fields: 'Encryption' is set to 'WPA RADIUS'; 'WPA Unicast Cipher Suite' has three radio buttons: 'WPA(TKIP)' (selected), 'WPA2(AES)', and 'WPA2 Mixed'; 'RADIUS Server IP address' is an empty text box; 'RADIUS Server Port' is set to '1812'; and 'RADIUS Server Password' is an empty text box. At the bottom right, there are 'Apply' and 'Cancel' buttons.

Parameters	Default	Description
WPA(TKIP)		TKIP can change the encryption key frequently to enhance the wireless LAN security.
WPA2(AES)		This use CCMP protocol to change encryption key frequently. AES can provide high level encryption to enhance the wireless LAN security.
WPA2 Mixed		This will use TKIP or AES based on the other communication peer automatically.
RADIUS Server IP address		The IP address of external RADIUS server.
RADIUS Server Port		The service port of the external RADIUS server.

RADIUS Server Password

The password used by external RADIUS server.

Click **<Apply>** at the bottom of the screen to save the above configurations. You can now configure other advance sections or start using the router (with the advance settings in place)

2.4.4 Access Control

This wireless router provides MAC Address Control, which prevents the unauthorized MAC Addresses from accessing your wireless network.

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HOME ADVANCED MENU STATUS TOOLS

MAC Address Filtering (Wireless)

The Wireless-108G router features added protection through wireless MAC Address filtering. If you wish to use this feature enter the MAC addresses below that you wish to give wireless access to.

• MAC Address Filtering Table
Up to 20 MAC Addresses

NO.	Address	Comment	Select
-----	---------	---------	--------

Delete Selected Delete All Reset

☐ **Enable Wireless Access Control**

New MAC address: Comment: Add Reset

Apply Cancel

Parameters	Description
Enable wireless access control	Enable wireless access control
Add MAC address into the list	Fill in the "MAC Address" and "Comment" of the wireless station to be added and then click "Add". Then this wireless station will be added into the "Current Access Control List" below. If you find any issues before adding it and want to retype again. Just click "Clear" and both "MAC Address" and "Comment" fields will be cleared.
Remove MAC address from the list	If you want to remove some MAC address from the "Current Access Control List ", select the MAC addresses you want to remove in the list and then click "Delete Selected". If you want remove all MAC addresses from the table, just click "Delete All" button. Click "Reset" will clear your current selections.

Click <**Apply**> at the bottom of the screen to save the above configurations. You can now configure other advance sections or start using the router (with the advance settings in place)

2.5 QoS

The QoS can let you classify Internet application traffic by source/destination IP address and port number. You can assign priority for each type of application and reserve bandwidth for it. The packets of applications with higher priority will always go first. Lower priority applications will get bandwidth after higher priority applications get enough bandwidth. This can let you have a better experience in using critical real time services like Internet phone, video conference ...etc. You can adjust the priority of the rules by moving them up or down.

Note: If the total assigned bandwidth of higher priority applications is larger than the maximum bandwidth provided by the WAN port, the other applications will not get any bandwidth.



Parameters	Description
Enable/Disable QoS	You can check "Enable QoS" to enable QoS function for the WAN port. You also can uncheck "Enable QoS" to disable QoS function for the WAN port.
Add a QoS rule into the table	Click "Add" then you will enter a form of the QoS rule. Click "Apply" after filling out the form and the rule will be added into the table.
Remove QoS rules from the table	If you want to remove some QoS rules from the table, select the QoS rules you want to remove

in the table and then click "Delete Selected". If you want remove all QoS rules from the table, just click "Delete All" button. Click "Reset" will clear your current selections.

Edit a QoS rule

Select the rule you want to edit and click "Edit", then you will enter the detail form of the QoS rule. Click "Apply" after editing the form and the rule will be saved.

Adjust QoS rule priority

You can select the rule and click "Move Up" to make its priority higher. You also can select the rule and click "Move Down" to make its priority lower.

Edit QoS Rule:

You can assign packet classification criteria by its local IP range, remote IP range, traffic type, protocol, local port range and remote port range parameters. The parameters that you leave as blank will be ignored. The priority of this rule will be applied to packets that match classification criteria of this rule. You can limit bandwidth consumed by packets that match this rule or guarantee bandwidth required by packets that match this rule.

QoS (Quality of Service)

This page allows users to add/modify the QoS rule's settings.

Rule Name :

Bandwidth :

Download

Kbps

guarantee

Local IP address :

-

Local Port Range :

Remote IP address :

-

Remote Port Range :

Traffic Type :

None

Protocol :

TCP

Save...

Reset

Parameters	Description
Rule Name	The name of this rule.
Bandwidth	You can assign the download or upload bandwidth by the unit of Kbps (1024 bit per

second). You can limit the maximum bandwidth consumed by this rule by selecting “Maximum”. You also can reserve enough bandwidth for this rule by selecting “Guarantee”.

Local IP Address

Enter the local IP address range of the packets that this rule will apply to. If you assign 192.168.2.3 – 192.168.2.5, it means 3 IP addresses: 192.168.2.3, 192.168.2.4 and 192.168.2.5

Local Port Range

Enter the local port range of the packets that this rule will apply to. You can assign a single port number here or assign a range of port numbers by assigning the first port number and the last port number of the range. The two numbers are separated by a dash “-”, for example “101-150” means from port number 100 to port number 150 – the range of 50 port numbers.

Remote IP Address

Enter the remote IP address range of the packets that this rule will apply to. If you assign 192.168.2.3 – 192.168.2.5, it means 3 IP addresses: 192.168.2.3, 192.168.2.4 and 192.168.2.5

Remote Port Range

Enter the remote port range of the packets that this rule will apply to. You can assign a single port number here or assign a range of port numbers by assigning the first port number and the last port number of the range. The two numbers are separated by a dash “-”, for example “101-150” means from port number 100 to port number 150 – the range of 50 port numbers.

Traffic Type

Select the traffic type of the packets that this rule will apply to. We list some popular applications here to ease the configuration. You also can get the same result by using other parameters, for example source or destination port number, if you are familiar with the application protocol.

Protocol

Select the protocol type of the packets that this rule will apply to.

Apply

Apply and exit the form.

Reset

Clear the content of this form.

Click **<Apply>** at the bottom of the screen to save the above configurations. You can now configure other advance sections or start using the router (with the advance settings in place)

2.6 NAT

Network Address Translation (NAT) allows multiple users at your local site to access the Internet through a single Public IP Address or multiple Public IP Addresses. NAT provides Firewall protection from hacker attacks and has the flexibility to allow you to map Private IP Addresses to Public IP Addresses for key services such as Websites and FTP.

NAT Settings

Network Address Translation (NAT) allows multiple users in your local area network to access the Internet through a single Public IP Address or multiple Public IP Addresses. NAT provides Firewall protection from hacker attacks and has the flexibility to allow you to map Private IP Addresses to Public IP Addresses for key services such as the Web or FTP.

Enable or disable the NAT function : ☒ Enable ☐ Disable

Apply

Parameter	Description
2.6.1 Port Forwarding	You can have different services (e.g. email, FTP, Web etc.) going to different service servers/clients in your LAN. The Port Forwarding allows you to re-direct a particular range of service port numbers (from the Internet/WAN Ports) to a particular LAN IP address.
2.6.2 Virtual Server	You can have different services (e.g. email, FTP, Web etc.) going to different service servers/clients in your LAN. The Virtual Server allows you to re-direct a particular service port number (from the Internet/WAN Port) to a particular LAN IP address and its service port number.
2.6.3 Special Applications	Some applications require multiple connections, such as Internet games, video conferencing, Internet telephony and others. In this section you can configure the router to support these types of applications.
2.6.4 UPnP Setting	It allows to Enable or Disable UPnP feature here. After you enable the UPnP feature, all client systems that support UPnP, like Windows XP, can discover this router automatically and access the Internet through this router without any configuration. The NAT Traversal function provided by UPnP can let applications that support

UPnP smoothly connect to Internet sites without any incompatibility problem due to the NAT port translation.

2.6.5 ALG Setting

You can select special applications that need "Application Layer Gateway" to support here.

2.6.6 Static Routing

You can disable NAT function and setup the routing rules manually.

Click on one of the three NAT selections and proceed to the manual's relevant sub-section.

Note: If NAT is disabled you the STATIC Routing feature will appear. You can manually configure your network routing protocols here. See section 2.6.6 for more information.

2.6.1 Port Forwarding

The Port Forwarding allows you to re-direct a particular range of service port numbers (from the Internet/WAN Ports) to a particular LAN IP address. It help you to host some servers behind the router NAT firewall.

Port Forwarding ?

Entries in this table allow you to automatically redirect common network services to a specific user behind your firewall. These settings are only necessary if you wish to host some sort of server like a web server, mail server or network camera server on the private local network behind your router's firewall.

☐ **Enable Port Forwarding**

Private IP	Type	Port Range	Comment
<input type="text"/>	Both <input type="button" value="v"/>	<input type="text"/> - <input type="text"/>	<input type="text"/>
<input type="button" value="Add"/>	<input type="button" value="Reset"/>		

Current Port Forwarding Table

NO.	Private IP	Type	Port Range	Comment	Select

Parameter	Description
Enable Port Forwarding	Enable Port Forwarding
Private IP	This is the private IP of the server behind the NAT firewall. Note: You need to give your LAN PC clients a fixed/static IP address for Port Forwarding to work properly.
Type	This is the protocol type to be forwarded. You can choose to forward "TCP" or "UDP" packets only or select "both" to forward both "TCP" and "UDP" packets.
Port Range	The range of ports to be forward to the private IP.
Comment	The description of this setting.
Add Port Forwarding into the table	Fill in the "Private IP", "Type", "Port Range" and "Comment" of the setting to be added and then

click "Add". Then this Port Forwarding setting will be added into the "Current Port Forwarding Table" below. If you find any typo before adding it and want to retype again, just click "Clear" and the fields will be cleared.


Remove Port Forwarding into the table

If you want to remove some Port Forwarding settings from the " Current Port Forwarding Table", select the Port Forwarding settings you want to remove in the table and then click "Delete Selected". If you want remove all Port Forwarding settings from the table, just click "Delete All" button. Click "Reset" will clear your current selections.

Click **<Apply>** at the bottom of the screen to save the above configurations. You can now configure other advance sections or start using the router (with the advance settings in place)


2.6.2 Virtual Server

Use the Virtual Server function when you want different servers/clients in your LAN to handle different service/Internet application type (e.g. Email, FTP, Web server etc.) from the Internet. Computers use numbers called port numbers to recognize a particular service/Internet application type. The Virtual Server allows you to re-direct a particular service port number (from the Internet/WAN Port) to a particular LAN private IP address and its service port number. (See Glossary for an explanation on Port number)

Virtual Server 

You can configure the Wireless-108G MIMO router as a Virtual Server so that remote users accessing services such as the Web or FTP at your local site via Public IP Addresses can be automatically redirected to local servers configured with Private IP Addresses. In other words, depending on the requested service (TCP/UDP) port number, the router redirects the external service request to the appropriate internal server (located at one of your LAN's Private IP Address).

☐ **Enable Virtual Server**

Private IP	Private Port	Type	Public Port	Comment
<input type="text"/>	<input type="text"/>	Both 	<input type="text"/>	<input type="text"/>

Current Virtual Server Table

NO.	Private IP	Private Port	Type	Public Port	Comment	Select
-----	------------	--------------	------	-------------	---------	--------

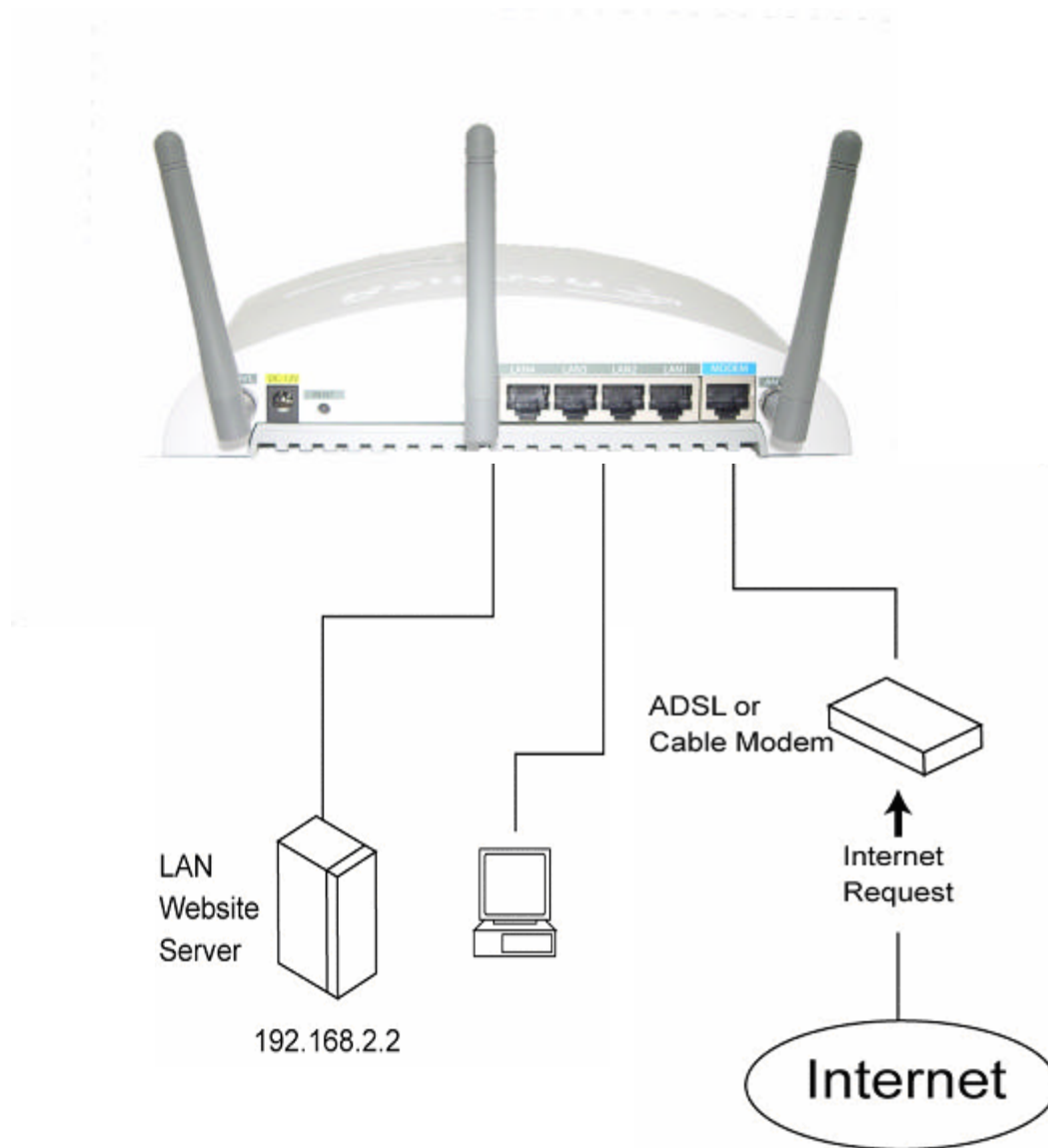
Parameters	Description
Enable Virtual Server	Enable Virtual Server.
Private IP	This is the LAN client/host IP address that the Public Port number packet will be sent to. Note: You need to give your LAN PC clients a fixed/static IP address for Virtual Server to work properly.
Private Port	This is the port number (of the above Private IP host) that the below Public Port number will be changed to when the packet enters your LAN (to the LAN Server/Client IP)

Type	Select the port number protocol type (TCP, UDP or both). If you are unsure, then leave it to the default both protocol.
Public Port	Enter the service (service/Internet application) port number from the Internet that will be re-directed to the above Private IP address host in your LAN Note: Virtual Server function will have priority over the DMZ function if there is a conflict between the Virtual Server and the DMZ settings.
Comment	The description of this setting.
Add Virtual Server	Fill in the "Private IP", "Private Port", "Type", "Public Port" and "Comment" of the setting to be added and then click "Add". Then this Virtual Server setting will be added into the "Current Virtual Server Table" below. If you find any typo before adding it and want to retype again, just click "Clear" and the fields will be cleared.
Remove Virtual Server	If you want to remove some Virtual Server settings from the "Current Virtual Server Table", select the Virtual Server settings you want to remove in the table and then click "Delete Selected". If you want remove all Virtual Server settings from the table, just click "Delete All" button. Click "Reset" will clear your current selections.

Click **<Apply>** at the bottom of the screen to save the above configurations. You can now configure other advance sections or start using the router (with the advance settings in place)

Example: Virtual Server

The diagram below demonstrates one of the ways you can use the Virtual Server function. Use the Virtual Server when you want the web server located in your private LAN to be accessible to Internet users. The configuration below means that any request coming from the Internet to access your web server will be translated to your LAN's web server (192.168.2.2). **Note:** For the virtual server to work properly Internet/remote users must know your global IP address. (For websites you will need to have a fixed/static global/public IP address)



Configuration

Private IP: 192.168.2.2


Private Port: 80

Type: TCP

Public Port: 80

2.6.3 Special Applications

Some applications require multiple connections, such as Internet games, video conferencing, Internet telephony and others. In this section you can configure the router to support multiple connections for these types of applications.

Special Applications 

Some applications require multiple connections, such as Internet gaming, video conferencing, Internet telephony and others. These applications will not work when Network Address Translation (NAT) is enabled. If you need to run applications that require multiple connections, specify the port normally associated with an application in the "Trigger Port" field. Select the protocol type as TCP or UDP, then enter the public ports associated with the trigger port to open them for inbound traffic.
Note: The range of the Trigger Port is 1 to 65535.

☐ **Enable Trigger Port**

Trigger Port	Trigger Type	Public Port	Public Type	Comment
<input type="text"/> - <input type="text"/>	Both <input type="button" value="v"/>	<input type="text"/>	Both <input type="button" value="v"/>	<input type="text"/>

Popular Applications

Current Trigger-Port Table

NO.	Trigger Port	Trigger Type	Public Port	Public Type	Comment	Select
-----	--------------	--------------	-------------	-------------	---------	--------

Parameters	Description
Enable Trigger Port	Enable the Special Application function.
Trigger Port	This is the out going (Outbound) range of port numbers for this particular application
Trigger Type	Select whether the outbound port protocol is "TCP", "UDP" or both.
Public Port	Enter the In-coming (Inbound) port or port range for this type of application (e.g. 2300-2400, 47624) Note: Individual port numbers are separated by a comma (e.g. 47624, 5775, 6541 etc.). To input a port range use a "dash" to separate the two port number range (e.g. 2300-2400)

Public Type	Select the Inbound port protocol type: "TCP", "UDP" or both
Comment	The description of this setting.
Popular applications	This section lists the more popular applications that require multiple connections. Select an application from the Popular Applications selection. Once you have selected an application, select a location (1-10) in the Copy to selection box and then click the Copy to button. This will automatically list the Public Ports required for this popular application in the location (1-10) you'd specified.
Add Special Application	<p>Fill in the "Trigger Port", "Trigger Type", "Public Port", "Public Type", "Public Port" and "Comment" of the setting to be added and then click "Add". Then this Special Application setting will be added into the "Current Trigger-Port Table" below. If you find any typo before adding it and want to retype again, just click "Clear" and the fields will be cleared.</p> <p>If you want to add a popular application, select one "Popular Application" and then click "Add".</p>
Remove Special Application	If you want to remove some Special Application settings from the "Current Trigger-Port Table", select the Special Application settings you want to remove in the table and then click "Delete Selected". If you want remove all Special Application settings from the table, just click "Delete All" button. Click "Reset" will clear your current selections.

Click **<Apply>** at the bottom of the screen to save the above configurations. You can now configure other advance sections or start using the router (with the advance settings in place)

Example: Special Applications

If you need to run applications that require multiple connections, then specify the port (outbound) normally associated with that application in the "Trigger Port" field. Then select the protocol type (TCP or UDP) and enter the public ports associated with the trigger port to open them up for inbound traffic.

Example:

ID	Trigger Port	Trigger Type	Public Port	Public Type	Comment
1	28800	UDP	2300-2400, 47624	TCP	MSN Game Zone
2	6112	UDP	6112	UDP	Battle.net

In the example above, when a user trigger's port 28800 (outbound) for MSN Game Zone then the

router will allow incoming packets for ports 2300-2400 and 47624 to be directed to that user.

Note: Only one LAN client can use a particular special application at a time.

2.6.4 UPnP Settings

With UPnP, all PCs in your Intranet will discover this router automatically. So you do not have to do any configuration for your PC and can access the Internet through this router easily.

UPnP

Universal Plug and Play allows specific UPnP devices to connect to your network automatically. By default this option is enabled. If you wish to disable it you may do so here.

UPnP Feature: ☐ Enable ☒ Disable

Parameters	Default	Description
UPnP Feature	Disable	You can Enable or Disable UPnP feature here. After you enable the UPnP feature, all client systems that support UPnP, like Windows XP, can discover this router automatically and access the Internet through this router without any configuration. The NAT Traversal function provided by UPnP can let applications that support UPnP smoothly connect to Internet sites without any incompatibility problem due to the NAT port translation.

Click **<Apply>** at the bottom of the screen to save the above configurations. You can now configure other advance sections or start using the router (with the advance settings in place)

2.6.5 ALG Settings

You can select applications that need “Application Layer Gateway” to support.

Parameters	Default	Description
Enable		You can select to enable “Application Layer Gateway”, then the router will let that application correctly pass though the NAT gateway.

Click **<Apply>** at the bottom of the screen to save the above configurations. You can now configure other advance sections or start using the router (with the advance settings in place)

Application Layer Gateway

Some internet applications require special support from the router to function correctly. Below is a list of applications requiring special support from the router. You may uncheck those that you do not wish to give special support to. (Note these applications may not work if not checked below)

Enable	Name	Comment
<input checked="" type="checkbox"/>	Amanda	Support for Amanda backup tool protocol.
<input checked="" type="checkbox"/>	Egg	Support for eggdrop bot networks.
<input checked="" type="checkbox"/>	FTP	Support for FTP.
<input checked="" type="checkbox"/>	H323	Support for H323/netmeeting.
<input checked="" type="checkbox"/>	IRC	Allows DCC to work though NAT and connection tracking.
<input checked="" type="checkbox"/>	MMS	Support for Microsoft Streaming Media Services protocol.
<input checked="" type="checkbox"/>	Quake3	Support for Quake III Arena connection tracking and nat.
<input checked="" type="checkbox"/>	Talk	Allows netfilter to track talk connections.
<input checked="" type="checkbox"/>	TFTP	Support for TFTP.
<input checked="" type="checkbox"/>	Starcraft	Support for Starcraft/Battle.net game protocol.
<input checked="" type="checkbox"/>	MSN	Support for MSN file tranfer.

2.6.6 Static Routing

This router provides a Static Routing function when NAT is disabled. With Static Routing, the router can forward packets according to your routing rules. The IP sharing function will not work any more in Static Routing mode.

Note: The DMZ function of firewall will not work if static routing is enabled.

HAWKING TECHNOLOGY HWRGM1A

HOME ADVANCED MENU STATUS TOOLS

ADVANCED MENU

- > System
- > WAN
- > LAN
- > Wireless
- > QoS
- > NAT
 - > Static Routing
- > Firewall

Static Routing

You can enable Static Routing to turn off NAT function of this router and let this router forward packets by your routing policy.

☐ Enable Static Routing

Destination LAN IP	Subnet Mask	Default Gateway	Hop Count	Interface
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	LAN

Current Static Routing Table

NO.	Destination LAN IP	Subnet Mask	Default Gateway	Hop Count	Interface	Select
-----	--------------------	-------------	-----------------	-----------	-----------	--------

Parameter	Description
Enable Static Routing	Static Routing function is default disabled. You have to enable the Static Routing function before your routing rules take effect.
Destination LAN IP	The network address of destination LAN.
Subnet Mask	The subnet mask of destination LAN.
Default Gateway	The next stop gateway of the path toward the destination LAN. This is the IP of the neighbor router that this router should communicate with on the path to the destination LAN.
Hop Count	The number of hops (routers) to pass through to reach the destination LAN.

Interface	The interface that go to the next hop (router).
Add a Rule	Fill in the "Destination LAN IP", "Subnet Mask", "Default Gateway", "Hop Count " and "Interface" of the rule to be added and then click "Add". Then this rule of Static Routing will be added into the 'Static Routing Table" below. If you find any typo before adding it and want to retype again, just click "Reset" and the fields will be cleared.
Remove a Rule	If you want to remove some routing rules from the "Static Routing Table", select the rules you want to remove in the table and then click "Delete Selected". If you want remove all rules from the table, just click "Delete All" button. Click "Reset" will clear your current selections.

Click **<Apply>** at the bottom of the screen to save the above configurations. You can now configure other advance sections or start using the router (with the advance settings in place)

2.7 Firewall

The Hi-Gain Wireless-108G MIMO Router provides extensive firewall protection by restricting connection parameters, thus limiting the risk of hacker attack, and defending against a wide array of common Internet attacks. However, for applications that require unrestricted access to the Internet, you can configure a specific client/server as a Demilitarized Zone (DMZ).

Note: To enable the Firewall settings select **Enable** and click **Apply**

Security Settings (Firewall)

This page lets you disable or enable your network firewall. The network firewall protects your computers from attacks over the internet. It is recommended that you enable your firewall at all times.

Enable or disable Firewall protection ☐ Enable ☒ Disable

Apply

Parameters	Description
2.6.1 Access Control	Access Control allows you to specify which hosts users can or cannot have access to certain Internet applications
2.6.2 URL Blocking	URL Blocking allow you to specify which URLs can not be accessed by users.
2.6.3 DoS	The Hi-Gain Wireless-108G MIMO Router's firewall can block common hacker attacks and can log the attack activities.
2.6.4 DMZ	The DMZ function allows you to re-direct all packets going to your WAN port IP address to a particular IP address in your LAN.

Click on one of the firewall selections and proceed to the manual's relevant sub-section

2.7.1 Access Control

If you want to restrict users from accessing certain Internet applications/services (e.g. Internet websites, email, FTP etc.), then this is the place to set that configuration. Access Control allows users to define the traffic type permitted in your LAN. You can control which PC client can have access to these services.

HAWKING TECHNOLOGY HWRGM1A

HOME ADVANCED MENU STATUS TOOLS

ADVANCED MENU

- System
- WAN
- LAN
- Wireless
- QoS
- NAT
- Firewall
 - Access Control
 - URL Blocking
 - DoS
 - DMZ

Security Settings (Firewall)

Access Control allows users to define the traffic type permitted or not permitted in your LAN. You can control which PC client uses what services in which they can have access to these services. If both of MAC filtering and IP filtering are enabled simultaneously, the MAC filtering table will be checked first and then IP filtering table.

☐ Enable MAC Filtering ☒ Deny ☐ Allow

Client PC MAC address	Comment
<input type="text"/>	<input type="text"/>

MAC Filtering Table

NO.	Client PC MAC address	Comment	Select
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☐ Enable IP Filtering Table (up to 20 computers) ☒ Deny ☐ Allow

NO.	Client PC Description	Client PC IP address	Client Service	Protocol	Port Range	Select
-----	-----------------------	----------------------	----------------	----------	------------	--------

Parameters	Description
Deny	If select “Deny” then all PCs will be allowed to access Internet accept for the PCs in the list below.
Allow	If select “Allow” then all PCs will be denied to access Internet accept for the PCs in the list below.
Filter client PCs by IP	Fill “IP Filtering Table” to filter PC clients by IP.
Add PC	You can click Add PC to add an access control rule for users by IP addresses.
Remove PC	If you want to remove some PC from the "IP Filtering Table", select the PC you want to remove in the table and then click "Delete Selected". If you

want remove all PCs from the table, just click "Delete All" button.

Filter client PC by MAC address Check “Enable MAC Filtering” to enable MAC Filtering.

Add PC Fill in “Client PC MAC Address” and “Comment” of the PC that is allowed to access the Internet, and then click “Add”. If you find any typo before adding it and want to retype again, just click "Reset" and the fields will be cleared.

Remove PC If you want to remove some PC from the "MAC Filtering Table", select the PC you want to remove in the table and then click "Delete Selected". If you want remove all PCs from the table, just click "Delete All" button. If you want to clear the selection and re-select again, just click “Reset”.

You can now configure other advance sections or start using the router (with the advance settings in place)

Add PC

Parameters	Description
Client PC Description	The description for this client PC rule.
Client PC IP Addresses	<p>Enter the IP address range that you wish to apply this Access Control rule. This is the user's IP address(es) that you wish to setup an Access Control rule.</p> <p>Note: You need to give your LAN PC clients a fixed/static IP address for the Access Control rule to work properly.</p>
Client PC Service	You can block the clients from accessing some Internet services by checking the services you want to block.
Protocol	This allows you to select UDP, TCP or both protocol type you want to block.
Port Range	It can be assign up to five port ranges. The router will block clients from accessing Internet services that use these ports.

Apply Changes

Click “Apply Changes” to save the setting.

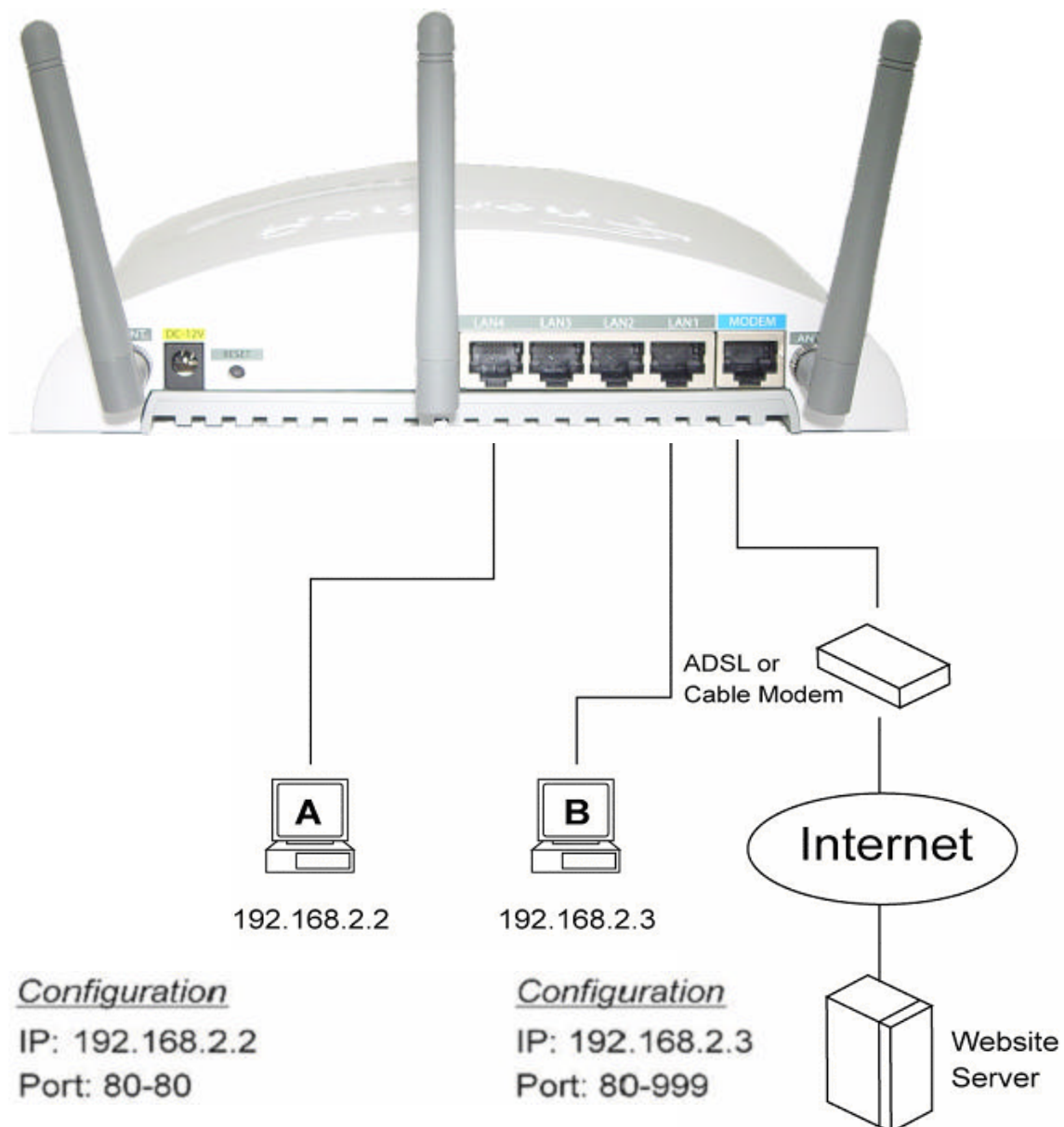
Reset

Click “Reset” to clear all fields.

Click **<Apply Changes>** at the bottom of the screen to save the above configurations. You can now configure other advance sections or start using the router (with the advance settings in place)

Example: Access Control

In the example below, LAN client A can only access websites that use Port 80. However, LAN client B is able to access websites and any other service that uses ports between 80 and 999.



2.7.2 URL Blocking

You can block access to some Web sites from particular PCs by entering a full URL address or just a keyword of the Web site.

The screenshot shows the Hawking Technology HWRGM1A web interface. The top navigation bar includes 'HOME', 'ADVANCED MENU', 'STATUS', and 'TOOLS'. The left sidebar lists various configuration options under 'ADVANCED MENU', including 'System', 'WAN', 'LAN', 'Wireless', 'QoS', 'NAT', 'Firewall', 'Access Control', 'URL Blocking', 'DDNS', and 'DMZ'. The main content area is titled 'URL Blocking' and contains the following elements:

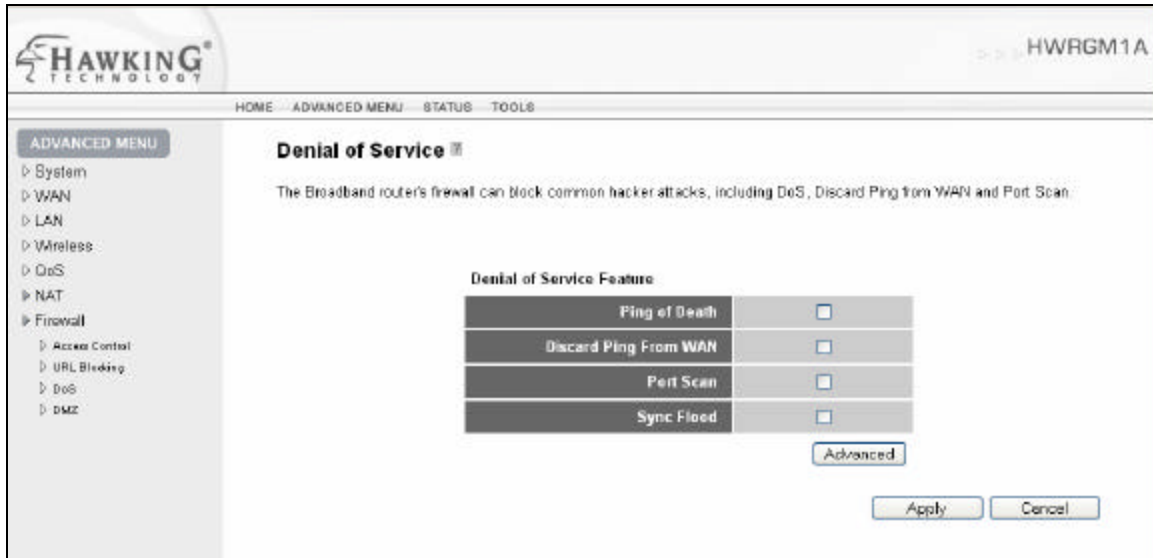
- A checkbox labeled 'Enable URL Blocking'.
- A text input field labeled 'URL/Keyword'.
- 'Add' and 'Reset' buttons below the input field.
- A table titled 'Current URL Blocking Table' with columns 'NO.', 'URL/Keyword', and 'Select'.
- 'Delete Selected', 'Delete All', and 'Reset' buttons below the table.
- 'Apply' and 'Cancel' buttons at the bottom right of the page.

Parameters	Description
Enable URL Blocking	Enable/disable URL Blocking
Add URL Keyword	Fill in “URL/Keyword” and then click “Add”. You can enter the full URL address or the keyword of the web site you want to block. If you have a typo and want to retype the word again, click "Reset" and the field will be cleared.
Remove URL Keyword	If you want to remove a URL keyword from the "Current URL Blocking Table", select the URL keyword you want to remove in the table and then click "Delete Selected". If you want remove all URL keywords from the table, just click "Delete All" button. If you want to clear the selection and re-select again, just click “Reset”.

You can now configure other advance sections or start using the router (with the advance settings in place)

2.7.3 DoS (Denial of Service)

The Hi-Gain Wireless-108G MIMO Router's firewall can block common hacker attacks, including Denial of Service, Ping of Death, Port Scan and Sync Flood. If Internet attacks occur the router will log the events.



Parameters	Description
Intrusion Detection Feature	
Ping of Death	Protections from Ping of Death attack
Discard Ping From WAN	The router's WAN port will not respond to any Ping requests
Port Scan	Protection the router from Port Scan.
Sync Flood	Protection the router from Sync Flood attack.
Click <Apply> at the bottom of the screen to save the above configurations. You can now configure other advance sections or start using the router (with the advance settings in place)	

2.7.4 DMZ

If you have a local client PC that cannot run an Internet application (e.g. Games) properly from behind the NAT firewall, then you can open the client up to unrestricted two-way Internet access by defining a DMZ Host. The DMZ function allows you to re-direct all packets going to your WAN port IP address to a particular IP address in your LAN. The difference between the virtual server and the DMZ function is that the virtual server re-directs a particular service/Internet application (e.g. FTP, websites) to a particular LAN client/server, whereas DMZ re-directs all packets (regardless of services) going to your WAN IP address to a particular LAN client/server.

HAWKING TECHNOLOGY HWRGM1A

HOME ADVANCED MENU STATUS TOOLS

ADVANCED MENU

- System
- WAN
- LAN
- Wireless
- QoS
- NAT
- Firewall
- Access Control
- URL Filtering
- DDoS
- DMZ

DMZ(Demilitarized Zone)

If you have a local client PC that cannot run an Internet application properly from behind the NAT firewall, then you can open the client up to unrestricted two-way Internet access by defining a Virtual DMZ Host.

☐ Enable DMZ

Public IP address	Client PC IP address
<input checked="" type="radio"/> Dynamic IP Session1	
<input type="radio"/> Static IP	

Current DMZ Table

NO.	Public IP address	Client PC IP address	Select
-----	-------------------	----------------------	--------

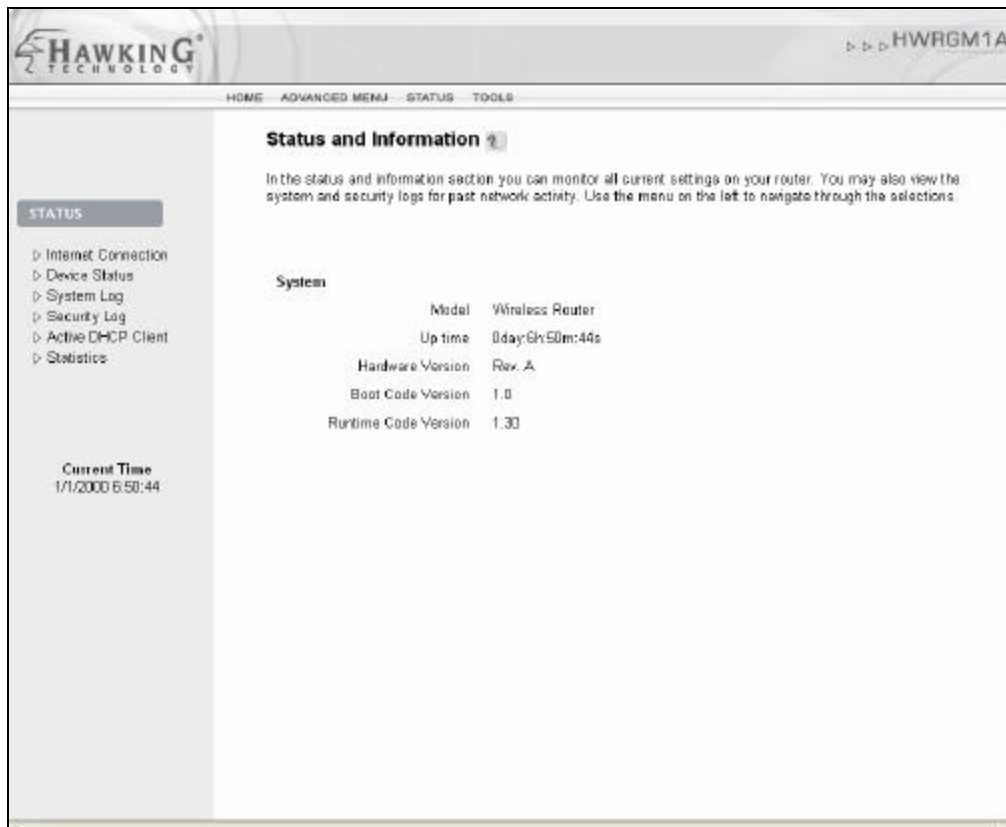
Parameters	Description
Enable DMZ	Enable/disable DMZ <p>Note: If there is a conflict between the Virtual Server and the DMZ setting, then Virtual Server function will have priority over the DMZ function.</p>
Public IP Address	The IP address of the WAN port or any other Public IP addresses given to you by your ISP
Client PC IP Address	Input the IP address of a particular host in your LAN that will receive all the packets originally going to the WAN port/Public IP address above <p>Note: You need to give your LAN PC clients a fixed/static IP address for DMZ to work properly.</p>

You can now configure other advance sections or start using the router (with the advance settings in place

Chapter 3

Status

The Status section allows you to monitor the current status of your router. You can use the Status page to monitor: the connection status of the Hi-Gain Wireless-108G MIMO Router's WAN/LAN interfaces, the current firmware and hardware version numbers, any illegal attempts to access your network, and information on all DHCP client PCs currently connected to your network.



Parameters	Description
3.1 Status and Information	Shows the router's system information
3.2 Internet Connection	View the Hi-Gain Wireless-108G MIMO Router's current Internet connection status and other related information
3.3 Device Status status	View the Hi-Gain Wireless-108G MIMO Router's current setting status
3.4 System Log	View the Hi-Gain Wireless-108G MIMO Router's system log

3.5 Security Log	View any attempts that have been made to illegally gain access to your network.
3.6 Active DHCP Client	View your LAN client's information that is currently linked to the Hi-Gain Wireless-108G MIMO Router's DHCP server
3.7 Statistics	Shows the statistics

Select one of the above five Status selections and proceed to the manual's relevant sub-section

3.1 Status and Information

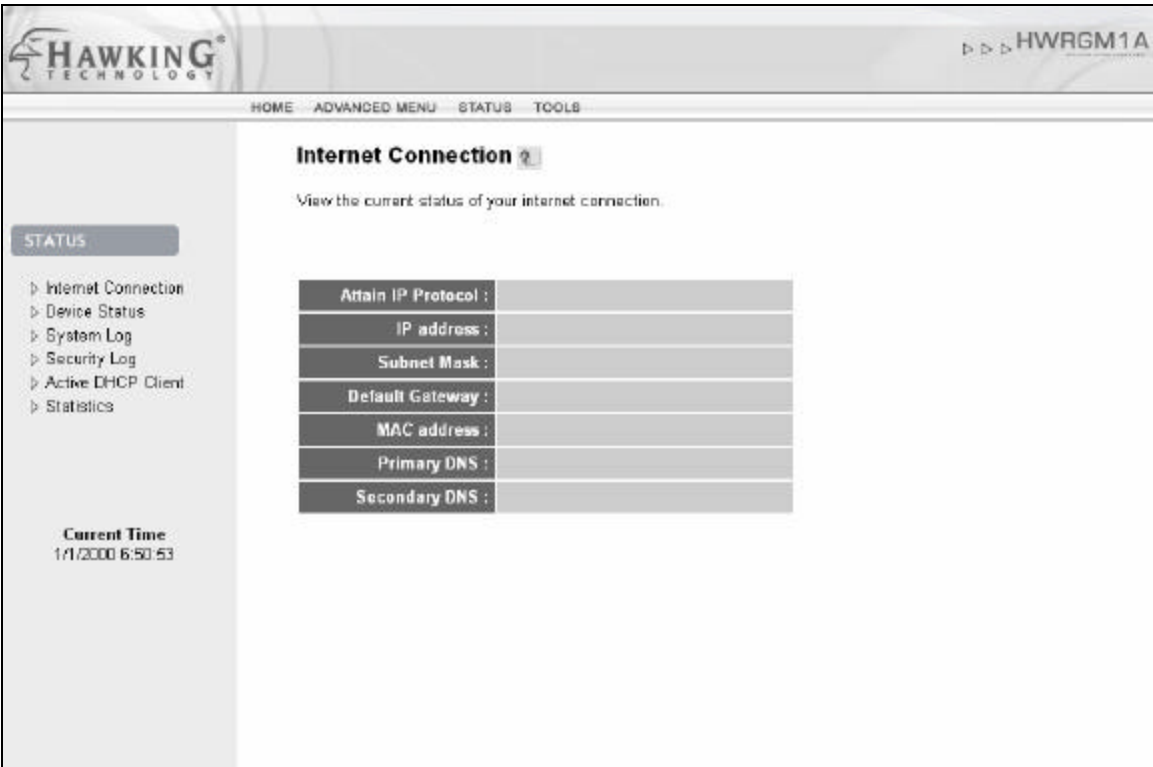
The Status and Information section allows you to view the router's system information



Parameters	Description
Information	You can see the router's system information such as the router's: LAN MAC Address, WAN MAC Address, Hardware version, Serial Number, Boot code Version, Runtime code Version

3.2 Internet Connection

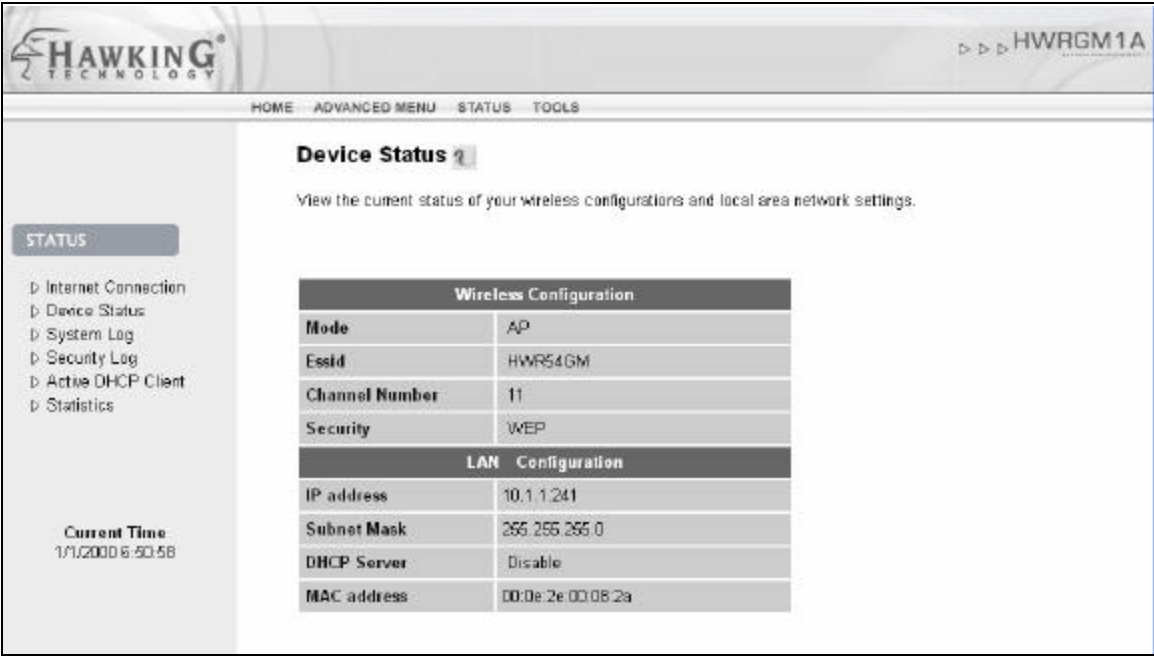
View the Hi-Gain Wireless-108G MIMO Router's current Internet connection status and other related information



Parameters	Description
Internet Connection	This page displays whether the WAN port is connected to a Cable/DSL connection. It also displays the router's WAN port: WAN IP address, Subnet Mask , and ISP Gateway as well as the Primary DNS and Secondary DNS being used.

3.3 Device Status

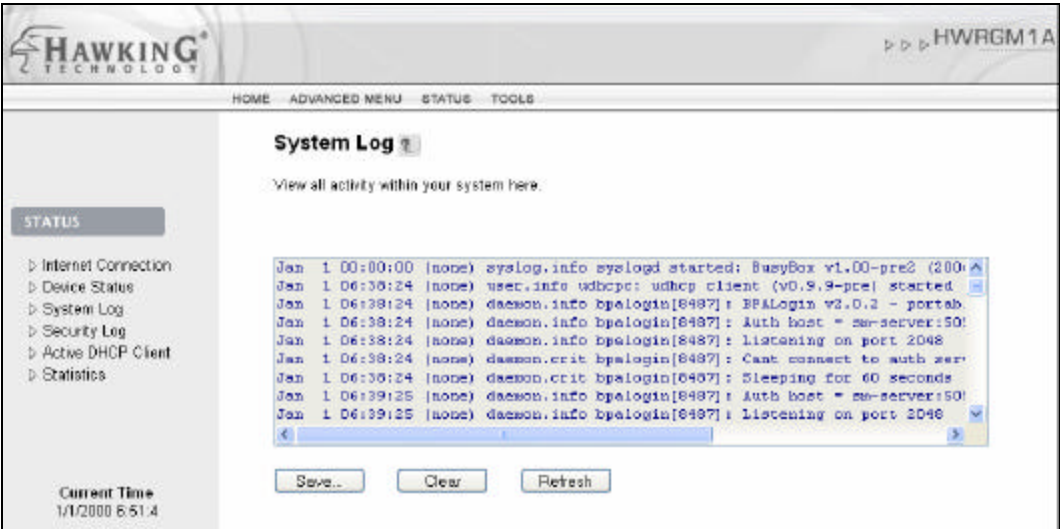
View the Hi-Gain Wireless-108G MIMO Router's current configuration settings. The Device Status displays the configuration settings you've configured in the **Quick Setup Wizard/Advanced menu** section.



Parameters	Description
Device Status	This page shows the Hi-Gain Wireless-108G MIMO Router's current device settings. This page displays the Hi-Gain Wireless-108G MIMO Router LAN port's current LAN IP Address and Subnet Mask . It also shows whether the DHCP Server function is enabled/disabled..

3.4 System Log

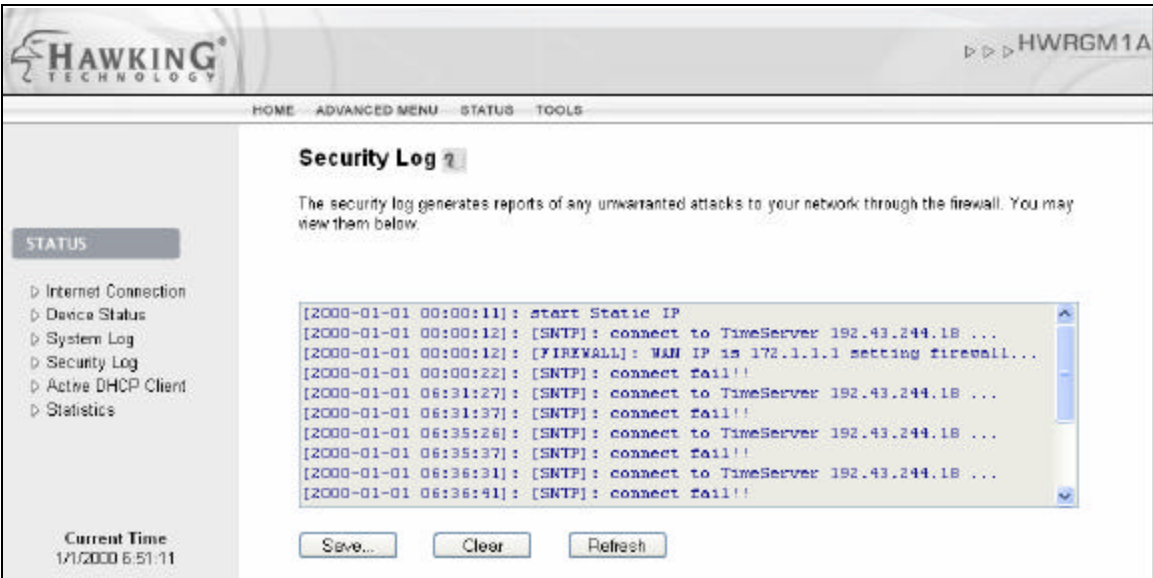
View the operation log of the system.



Parameters	Description
System Log	<p>This page shows the current system log of the Hi-Gain Wireless-108G MIMO Router. It displays any events that occur after system start up.</p> <p>At the bottom of the page, the system log can be saved <Save> to a local file for further processing or the system log can be cleared <Clear> or it can be refreshed <Refresh> to get the most updated situation. When the system is turned off, the system log will disappear if not saved to a local file.</p>

3.5 Security Log

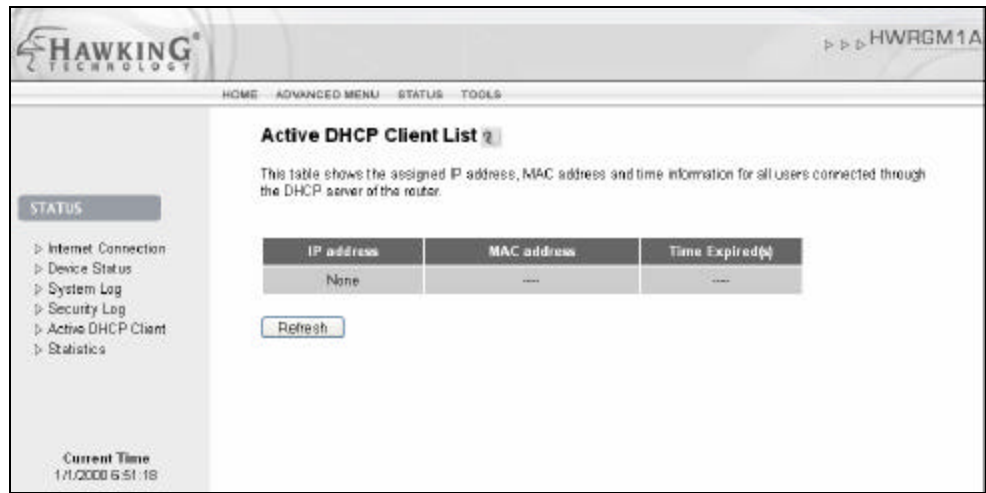
View any attempts that have been made to illegally gain access to your network.



Parameters	Description
Security Log	<p>This page shows the current security log of the Hi-Gain Wireless-108G MIMO Router. It displays any illegal attempts to access your network.</p> <p>At the bottom of the page, the security log can be saved <Save> to a local file for further processing or the security log can be cleared <Clear> or it can be refreshed <Refresh> to get the most updated situation. When the system is turned off, the security log will disappear if not saved to a local file.</p>

3.6 Active DHCP Client

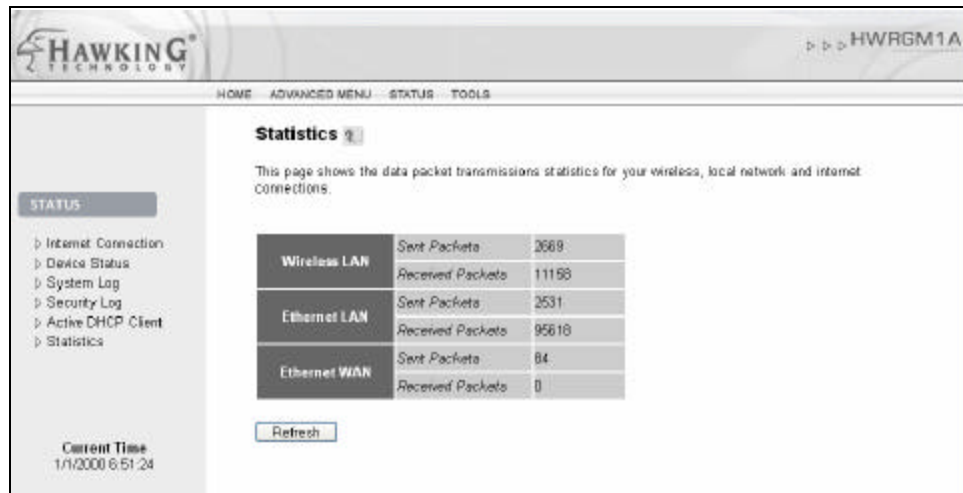
View information regarding computers and network devices that are currently connected to your router's DHCP server.



Parameters	Description
Active DHCP Client	This page shows all DHCP clients (LAN PCs) currently connected to your network. The “Active DHCP Client Table” displays the IP address and the MAC address and Time Expired of each LAN Client. Use the Refresh button to get the most updated situation

3.7 Statistics

View the statistics of packets sent and received on WAN, LAN and Wireless LAN.

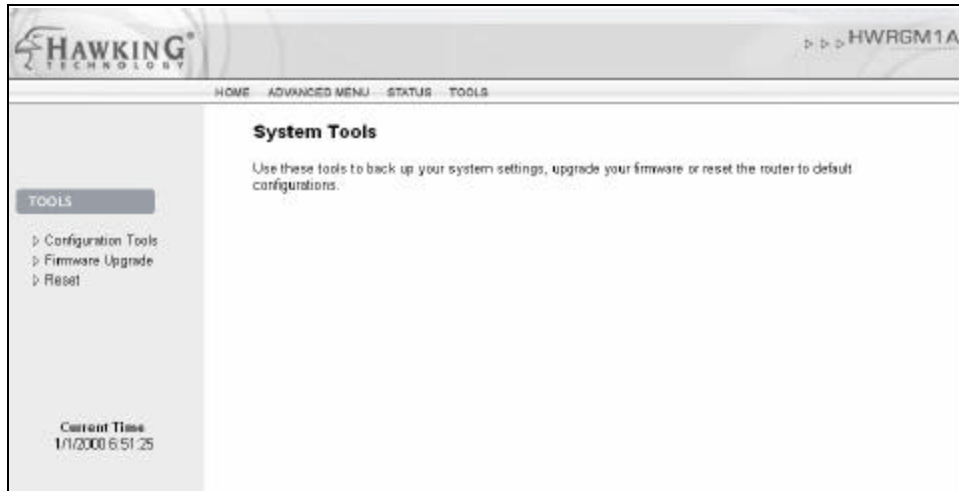


Parameters	Description
Statistics	Shows the counters of packets sent and received on WAN, LAN and Wireless LAN.

Chapter 4

Tools

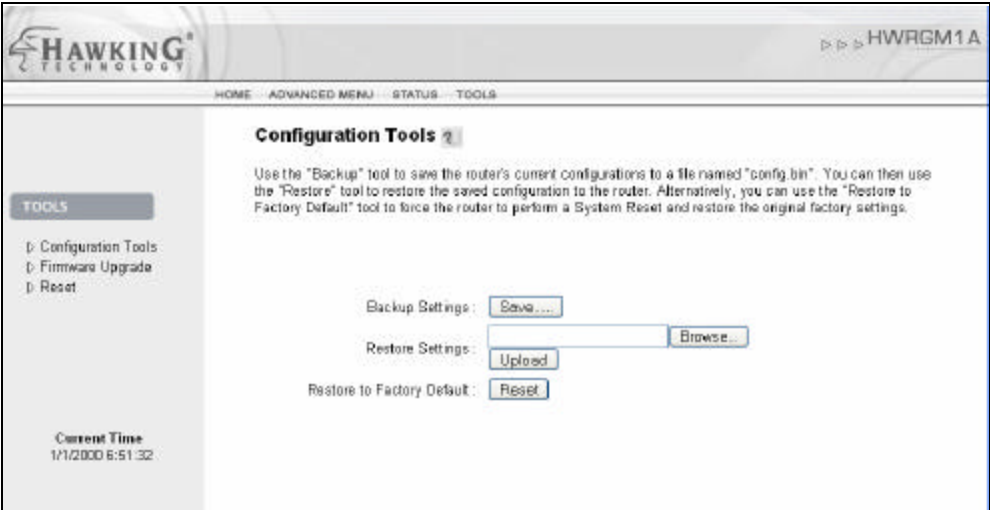
This page includes the basic configuration tools, such as Configuration Tools (save or restore configuration settings), Firmware Upgrade (upgrade system firmware) and Reset.



Parameters	Description
4.1 Configuration Tools	You can save the router's current configuration, restore the router's saved configuration files and restore the router's factory default settings
4.2 Firmware Upgrade	This page allows you to upgrade the router's firmware
4.3 Reset	You can reset the router's system should any problem exist
Select one of the above three Tools Settings selection and proceed to the manual's relevant sub-section	

4.1 Configuration Tools

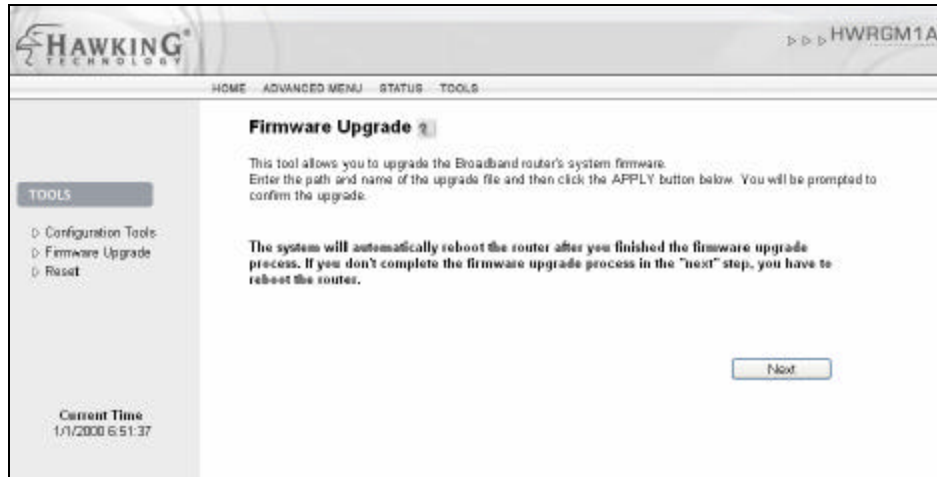
The Configuration Tools screen allows you to save (**Backup**) the router's current configuration setting. Saving the configuration settings provides an added protection and convenience should problems occur with the router and you have to reset to factory default. When you save the configuration setting (Backup) you can re-load the saved configuration into the router through the **Restore** selection. If extreme problems occur you can use the **Restore to Factory Defaults** selection, this will set all configurations to its original default settings (e.g. when you first purchased the router).



Parameters	Description
Configuration Tools	Use the " Backup " tool to save the Hi-Gain Wireless-108G MIMO Router current configuration to a file named "config.bin" on your PC. You can then use the " Restore " tool to restore the saved configuration to the Hi-Gain Wireless-108G MIMO Router. Alternatively, you can use the " Restore to Factory Defaults " tool to force the Hi-Gain Wireless-108G MIMO Router to perform a power reset and restore the original factory settings.

4.2 Firmware Upgrade

This page allows you to upgrade your router's firmware. The firmware is the software that is embedded within your router. When new features and fixes are available they will be posted on the Hawking Technologies website for download and upgrading of your router.

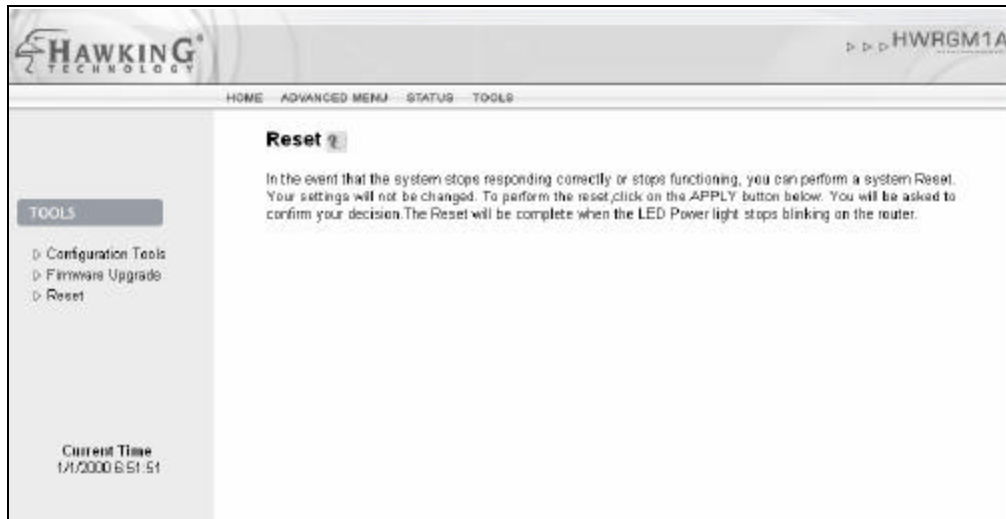


Parameters	Description
Firmware Upgrade	This tool allows you to upgrade the Hi-Gain Wireless-108G MIMO Router's system firmware. To upgrade the firmware of your Hi-Gain Wireless-108G MIMO Router, you need to download the firmware file to your local hard disk, and enter that file name and path in the appropriate field on this page. You can also use the Browse button to find the firmware file on your PC.

Once you've selected the new firmware file, click **<Apply>** at the bottom of the screen to start the upgrade process. (You may have to wait a few minutes for the upgrade to complete). Once the upgrade is complete you can start using the router.

4.3 Reset

If you experience a problem or the router locks up for some reason you may perform a system reset. The reset function essentially Re-boots your router's system. This can also be done by powering the router off and back on.



Parameters	Description
Reset	In the event that the system stops responding correctly or in some way stops functioning, you can perform a reset. Your settings will not be changed. To perform the reset, click on the <APPLY> button. You will be asked to confirm your decision. The reset will be complete when the power light stops blinking. Once the reset process is complete you may start using the router again.

Common Issues for Mac Users

Connection Issues:

Check to See if ALL Computers are Affected

If you have more than one computer that connects through the Wireless Router, check to see if all clients are affected. This may allow you to skip sections of this guide that are not relevant to you. Consider these questions:

Is Only One Computer Affected?

If so, concentrate on troubleshooting client settings on that computer. Make sure that its AirPort card is properly installed, with the antenna connected.

If All Computers are Affected:

- 1 Unplug the Wireless Router.
- 2 Wait 30 seconds.
- 3 Plug the wireless router back in.
- 4 Try to connect to the Internet from a client computer.

Or if that does not work try:

1. Unplug the power to your Cable or DSL Modem
2. Make sure your Wireless Router is powered ON.
3. Wait 5 minutes
4. Plug the power of the Cable/DSL Modem Back in.
5. Try to connect to the Internet from a client computer.

This lets the Cable or DSL Modem associate itself correctly to the new Router.

If ONLY one Computer is Affected:

Concentrate on factors that affect wireless clients, such as:

- Network selection and security keys
- Hardware access control
- Client TCP/IP settings
- Signal strength
- Sources of interference

Check all settings, cable routing, connections, and power supplies of your Wireless Router.

How do I File Share without using Apple Talk?

Using standard TCP/IP methods, file sharing and local networking can be accomplished.

Connecting to a Server

To connect to a server (OS X 10.1 and above) using your Mac Keyboard hit the Apple Symbol and K simultaneously. This will bring up a window to Connect to a Server. Enter the Server IP address here and it will be added to your network.

Connecting to Mac Computers over the LAN

OS X will automatically find Mac OSX based computers in your network. You simply have to view your Network from the Finder and you will see all local computers.

Connecting to Windows Based Computers via the LAN

Using OS X you will need to enter your System Preferences and open the Network page to change your settings and allow for Windows Computers to be networked.

Can clients connect to the base station but not make any IP connections?

If clients get a strong signal connection to the base station but cannot use the network (such as Web browsing or local file sharing), check to see if you are experiencing a PPPoE scenario or if your computer is set on the wrong IP settings, or if the Router is on Static IP and DHCP is off.

Lost network password

Hit the RESET button on the back panel of the Router for over 5 seconds and the Router will return to default settings. (Login: Admin, Password: None).

Using WPA and WPA2 Wireless Security with My Mac

See below – different OSX versions support different wireless security features. Check the Apple support page for more information.

Use the latest version of the Mac OS that you can

It is best to have the latest version of the Mac OS that you can use, whether you have Mac OS 9 or Mac OS X. Use the Software Update control panel (Mac OS 9) or Software Update preferences (Mac OS X) to install software updates. Because some updates are prerequisite for others, repeatedly use Software Update until there are no updates left to install.

View the Apple website for the latest information on your OS updates and AirPort Card Updates.

Use appropriate AirPort software and base station firmware

For Mac OS 9

AirPort versions 2.0 and 2.0.2 for Mac OS 9 work with Mac OS 9.0.4 or later, but Mac OS 9.1 or later is best.

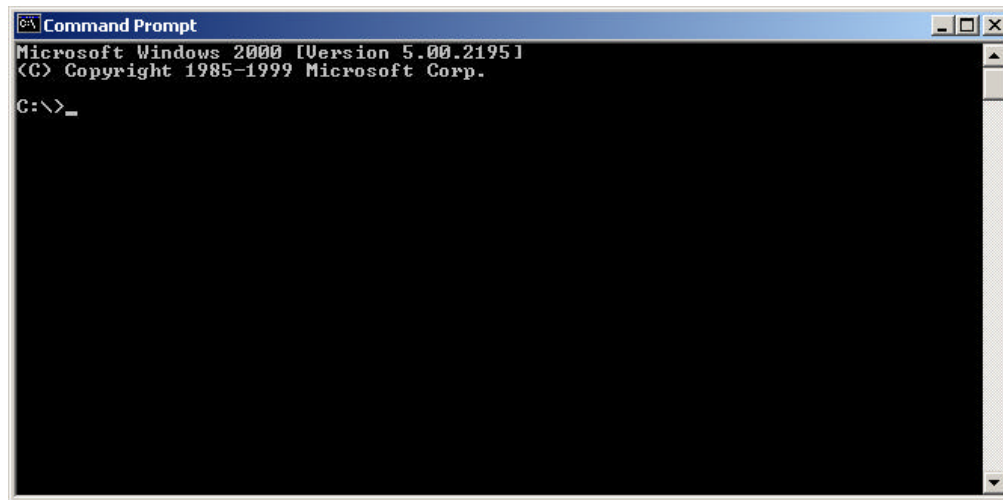
For Mac OS X

To get the latest version of AirPort software that works with your version of Mac OS X, use Software Update preferences.

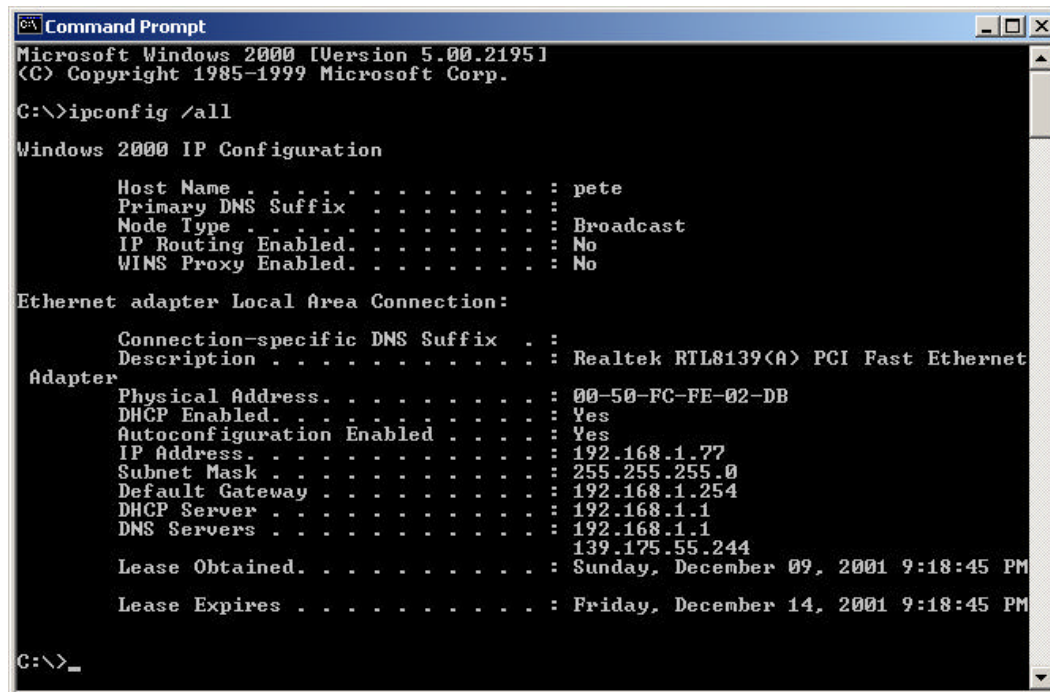
Appendix A

How to Manually find your Windows PC's IP and MAC address

- 1) In Window's open the Command Prompt program



- 2) Type **ipconfig /all** and <enter>



- Your PC's IP address is the one entitled **IP address** (192.168.1.77)
- The router's IP address is the one entitled **Default Gateway** (192.168.1.254)
- Your PC's MAC Address is the one entitled **Physical Address** (00-50-FC-FE-02-DB)

Glossary

Default Gateway (Router): Every non-router IP device needs to configure a default gateway's IP address. When the device sends out an IP packet, if the destination is not on the same network, the device has to send the packet to its default gateway, which will then send it out towards the destination.

DHCP: Dynamic Host Configuration Protocol. This protocol automatically gives every computer on your home network an IP address.

DNS Server IP Address: DNS stands for Domain Name System, which allows Internet servers to have a domain name (such as www.Broadbandrouter.com) and one or more IP addresses (such as 192.34.45.8). A DNS server keeps a database of Internet servers and their respective domain names and IP addresses, so that when a domain name is requested (as in typing "Broadbandrouter.com" into your Internet browser), the user is sent to the proper IP address. The DNS server IP address used by the computers on your home network is the location of the DNS server your ISP has assigned to you.

DSL Modem: DSL stands for Digital Subscriber Line. A DSL modem uses your existing phone lines to transmit data at high speeds.

Ethernet: A standard for computer networks. Ethernet networks are connected by special cables and hubs, and move data around at up to 10/100 million bits per second (Mbps).

Idle Timeout: Idle Timeout is designed so that after there is no traffic to the Internet for a pre-configured amount of time, the connection will automatically be disconnected.

IP Address and Network (Subnet) Mask: IP stands for Internet Protocol. An IP address consists of a series of four numbers separated by periods, that identifies a single, unique Internet computer host in an IP network. Example: 192.168.1.254. It consists of 2 portions: the IP network address, and the host identifier.

The IP address is a 32-bit binary pattern, which can be represented as four cascaded decimal numbers separated by ".": `aaa.aaa.aaa.aaa`, where each "aaa" can be anything from 000 to 255, or as four cascaded binary numbers separated by ".": `bbbbbbbb.bbbbbbbb.bbbbbbbb.bbbbbbbb`, where each "b" can either be 0 or 1.

A network mask is also a 32-bit binary pattern, and consists of consecutive leading

1's followed by consecutive trailing 0's, such as

`11111111.11111111.11111111.00000000`. Therefore sometimes a network mask can also be described simply as "x" number of leading 1's.

When both are represented side by side in their binary forms, all bits in the IP address that correspond to 1's in the network mask become part of the IP network address, and the remaining bits correspond to the host ID.

For example, if the IP address for a device is, in its binary form,

`11011001.10110000.10010000.00000111`, and if its network mask is,

`11111111.11111111.11110000.00000000`

It means the device's network address is

`11011001.10110000.10010000.00000000`, and its host ID is,

`00000000.00000000.00000000.00000111`. This is a convenient and efficient method for routers to route IP packets to their destination.

ISP Gateway Address: (see ISP for definition). The ISP Gateway Address is an IP address for the Internet router located at the ISP's office.

ISP: Internet Service Provider. An ISP is a business that provides connectivity to the Internet for individuals and other businesses or organizations.

LAN: Local Area Network. A LAN is a group of computers and devices connected together in a relatively small area (such as a house or an office). Your home network is considered a LAN.

MAC Address: MAC stands for Media Access Control. A MAC address is the hardware address of a device connected to a network. The MAC address is a unique identifier for a device with an Ethernet interface. It is comprised of two parts: 3 bytes of data that corresponds to the Manufacturer ID (unique for each manufacturer), plus 3 bytes that are often used as the product's serial number.

NAT: Network Address Translation. This process allows all of the computers on your home network to use one IP address. Using the Hi-Gain Wireless-108G MIMO Router's NAT capability, you can access the Internet from any computer on your home network without having to purchase more IP addresses from your ISP.

Port: Network Clients (LAN PC) uses port numbers to distinguish one network application/protocol over another. Below is a list of common applications and protocol/port numbers:

Application	Protocol	Port Number
Telnet	TCP	23
FTP	TCP	21
SMTP	TCP	25
POP3	TCP	110
H.323	TCP	1720
SNMP	UCP	161
SNMP Trap	UDP	162
HTTP	TCP	80
PPTP	TCP	1723
PC Anywhere	TCP	5631
PC Anywhere	UDP	5632

PPPoE: Point-to-Point Protocol over Ethernet. Point-to-Point Protocol is a secure data transmission method originally created for dial-up connections; PPPoE is for Ethernet connections. PPPoE relies on two widely accepted standards, Ethernet and the Point-to-Point Protocol. It is a communications protocol for transmitting information over Ethernet between different manufacturers

Protocol: A protocol is a set of rules for interaction agreed upon between multiple parties so that when they interface with each other based on such a protocol, the interpretation of their behavior is well defined and can be made objectively, without confusion or misunderstanding.

Router: A router is an intelligent network device that forwards packets between different networks based on network layer address information such as IP addresses.

Subnet Mask: A subnet mask, which may be a part of the TCP/IP information provided by your ISP, is a set of four numbers (e.g. 255.255.255.0) configured like an IP address. It is used to create IP address numbers used only within a particular network (as opposed to valid IP address numbers recognized by the Internet, which must be assigned by InterNIC).

TCP/IP, UDP: Transmission Control Protocol/Internet Protocol (TCP/IP) and Unreliable Datagram Protocol (UDP). TCP/IP is the standard protocol for data transmission over the Internet. Both TCP and UDP are transport layer protocol. TCP performs proper error detection and error recovery, and thus is reliable. UDP on the other hand is not reliable. They both run on top of the IP (Internet Protocol), a network layer protocol.

WAN: Wide Area Network. A network that connects computers located in geographically separate areas (e.g. different buildings, cities, countries). The Internet is a wide area network.

Web-based management Graphical User Interface (GUI): Many devices support a graphical user interface that is based on the web browser. This means the user can use the familiar Netscape or Microsoft Internet Explorer to Control/configure or monitor the device being managed.

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